MODELS | SJ 3220 SJ 3226 SJ 4620 SJ 4626 SJ 4632



Service Manual

SJIII Conventional Series (CE)

Part No. 155145AD November 2013

SKYJACK

This manual is based on Serial Number(s):

SJIII 3320 60,002,032 TO 60,002,258
SJIII 3226 27,005,501 TO 27,006,431
SJIII 46xx 70,006,053 TO 70,007,138

Please refer to the website (www.skyjack.com) for older Serial Numbers.

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DC Electric Scissor Lifts
Service Manual

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The Safety Alert Symbol identifies important safety messages on aerial platforms, safety signs in manuals or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

This Safety Alert Symbol means attention!

Become alert! Your safety is involved.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT

IMPORTANT indicates a procedure essential for safe operation and which, if not followed, may result in a malfunction or damage to the aerial platform.

1

Section 1
SCHEDULE MAINTENANCE INSPECTIONS

Table of Contents

Notes

SKYJACK is continuously improving and expanding product features on its equipment, therefore, specifications and dimensions are subject to change without notice.

Aerial Platform Definition

A mobile device that has a positionable platform supported from ground level by a structure.

Purpose of Equipment

The SKYJACK SJIII Compact and Conventional series aerial platforms are designed to transport and raise personnel, tools and materials to overhead work areas.

Use of Equipment

The aerial platform is a highly maneuverable, mobile work station. Lifting and driving must be on a flat, level, compacted surface.

Manuals

Operating

The operating manual is considered a fundamental part of the aerial platform. It is a very important way to communicate necessary safety information to users and operators. A complete and legible copy of this manual must be kept in the provided weather-resistant storage compartment on the aerial platform at all times.

Service & Maintenance

The purpose of this is to provide the customer with the servicing and maintenance procedures essential for the promotion of proper machine operation for its intended purpose.

All information in this manual should be read and understood before any attempt is made to service the machine. The updated copy of the manuals are found on the company's website: www.skyjack.com.

Service Policy and Warranty

SKYJACK warrants each new SJIII Series work platform to be free of defective parts and workmanship for the first 24 months. Any defective part will be replaced or repaired by your local SKYJACK dealer at no charge for parts or labor. Contact the SKYJACK Service Department for warranty statement extensions or exclusions.

Optional Accessories

The SKYJACK aerial platform is designed to accept a variety of optional accessories. These are listed under "Standard and Optional Features" in Table 2.1 of the Operating Manual. Operating instructions for these options (if equipped) are located in section 2 of the operating manual.

For options not listed under "Standard and Optional Features," contact the SKYJACK Service Department at

☎ : 44-1691-676-235
🖷 : 44-1691-676-238

Include the model and serial number for each applicable aerial platform.

Scope of this Manual

a. This manual applies to the CE version of the SJIII Series aerial platform models listed on Table 2.1.

   Equipment identified with "CE" meets the requirements for the European countries, i.e., Machinery Directive 2006/42/EC and Directive 2004/108/EC and the corresponding EN standards.

b. Operators are required to conform to national, state or territorial/provincial and local health and safety regulations applicable to the operation of this aerial platform.

WARNING

Failure to comply with your required responsibilities in the use and operation of the aerial platform could result in death or serious injury!

Operator Safety Reminders

A study conducted by St. Paul Travelers showed that most accidents are caused by the failure of the operator to follow simple and fundamental safety rules and precautions.

You, as a careful operator, are the best insurance against an accident. Therefore, proper usage of this aerial platform is mandatory. The following pages of this manual should be read and understood completely before operating the aerial platform.

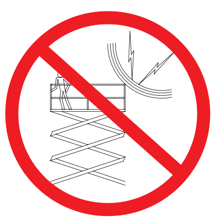
Common sense dictates the use of protective clothing when working on or near machinery. Use appropriate safety devices to protect your eyes, ears, hands, feet and body.

Any modifications from the original design are strictly forbidden without written permission from SKYJACK.

Electrocution Hazard

This aerial platform is not electrically insulated. Maintain a Minimum Safe Approach Distance (MSAD) from energized power lines and parts as listed below. The operator must allow for the platform to sway, rock or sag. This aerial platform does not provide protection from contact with or proximity to an electrically charged conductor.

DO NOT USE AERIAL PLATFORM AS A GROUND FOR WELDING.
DO NOT OPERATE AERIAL PLATFORM DURING LIGHTNING OR STORMS.





DANGER

Avoid Power Lines

Minimum Safe Approach Distance

CE Guidance Note

"Avoidance of danger from overhead lines"

Adhere strictly to the governmental rulings and regulations applicable in your country.

FAILURE TO AVOID THIS HAZARD WILL RESULT IN DEATH OR SERIOUS INJURY!

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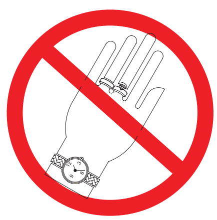
Safety Precautions

Know and understand the safety precautions before going on to next section.

WARNING

Failure to heed the following safety precautions could result in tip over, falling, crushing, or other hazards leading to death or serious injury.

- **KNOW** all national, state or territorial/provincial and local rules which apply to your aerial platform and jobsite.
- **TURN** main power disconnect switch "O" off when leaving the aerial platform unattended. Remove the key to prevent unauthorized use of the aerial platform.
- **WEAR** all the protective clothing and personal safety devices issued to you or called for by job conditions.
- **DO NOT** wear loose clothing, dangling neckties, scarves, rings, wristwatches or other jewelry while operating this lift.



- **AVOID** entanglement with ropes, cords or hoses.



- **AVOID** falling. Stay within the boundaries of the guardrails.



- **DO NOT** raise the aerial platform in windy or gusty conditions.



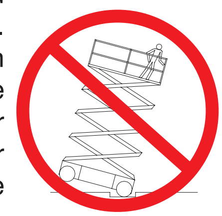
- **DO NOT** increase the lateral surface area of the platform. Increasing the area exposed to the wind will decrease aerial platform stability.



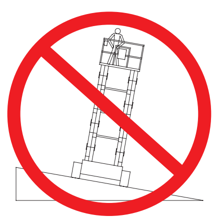
- **DO NOT** drive or elevate the aerial platform if it is not on a firm level surface. Do not drive elevated near depressions or holes of any type, loading docks, debris, drop-offs and surfaces that may affect the stability of the aerial platform.



- **If operation in areas with holes or drop-offs is absolutely necessary,** elevated driving shall not be allowed. Position the aerial platform horizontally only with the platform fully lowered. After ensuring that all 4 wheels or outriggers (if equipped) have contact with level firm surface, the aerial platform can be elevated. After elevation, the drive function must not be activated.



- **Elevated driving** must only be done on a firm level surface.



- **DO NOT** ascend or descend a grade when elevated. When fully lowered, ascending or descending only grades up to rated maximum listed in Table 2-3 are permissible.



Safety Precautions (Continued)

Know and understand the safety precautions before going on to next section.

- **DO NOT** operate on surfaces not capable of holding the weight of the aerial platform including the rated load, e.g. covers, drains, and trenches.

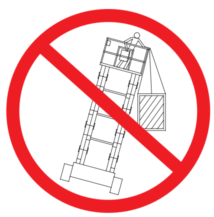
- **DO NOT** operate an aerial platform that has ladders, scaffolding or other devices mounted on it to increase its size or work height. It is prohibited.



- **DO NOT** exert side forces on aerial platform while elevated.



- **DO NOT** use the aerial platform as a crane. It is prohibited.



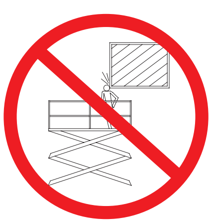
- **DO NOT** sit, stand or climb on the guardrails. It is prohibited.



- **DO NOT** climb on scissor arm assembly. It is prohibited.



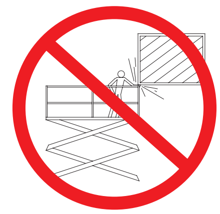
- **BE AWARE** of overhead obstructions or other possible hazards around the aerial platform when driving or lifting.



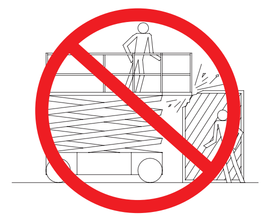
- **DO NOT** raise the aerial platform while the aerial platform is on a truck, fork lift or other device or vehicle.



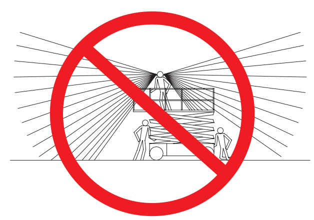
- **BE AWARE** of crushing hazards. Keep all body parts inside platform guardrail.



- **DO NOT** lower the platform unless the area below is clear of personnel and obstructions.



- **ENSURE** that there are no personnel or obstructions in the path of travel, including blind spots.



- **BE AWARE** of blind spots when operating the aerial platform.

- **STUNT** driving and horseplay are prohibited.

- **ENSURE ALL** tires are in good condition and lug nuts are properly tightened.

- **DO NOT** alter or disable limit switches or other safety devices.

- **DO NOT** use the aerial platform without guardrails, locking pins and the entry gate in place.

Safety Precautions (Continued)

Know and understand the safety precautions before going on to next section.

- **DO NOT** exceed the rated capacity of the aerial platform. Do make sure the load is evenly distributed on the platform.
- **DO NOT** attempt to free a snagged platform with lower controls until personnel are removed from the platform.
- **DO NOT** position the aerial platform against another object to steady the platform.
- **DO NOT** place materials on the guardrails or materials that exceed the confines of the guardrails unless approved by Skyjack.

WARNING

Entering and exiting the aerial platform should only be done using the three points of contact.

- Use only equipped access openings.
- Enter and exit only when the aerial platform is in the fully retracted position.

- Do use three points of contact to enter and exit the platform. Enter and exit the platform from the ground only. Face the aerial platform when entering or exiting the platform.
- Three points of contact means that two hands and one foot or one hand and two feet are in contact with the aerial platform or the ground at all times during entering and exiting.

WARNING

An operator should not use any aerial platform that:

- does not appear to be working properly.
- has been damaged or appears to have worn or missing parts.
- has alterations or modifications not approved by the manufacturer.
- has safety devices which have been altered or disabled.
- has been tagged or blocked out for non-use or repair.

Failure to avoid these hazards could result in death or serious injury.

Jobsite Inspection

- Do not use in hazardous locations.
- Perform a thorough jobsite inspection prior to operating the aerial platform, to identify potential hazards in your work area.
- Be aware of moving equipment in the area. Take appropriate actions to avoid collision.

Maintenance and Inspection Schedule

The actual operating environment of the work platform governs the use of the maintenance schedule. The inspection points covered in Table 1.2. Maintenance and Inspection Checklist, indicates the areas of the aerial platform to be maintained or inspected and at what intervals the maintenance and inspections are to be performed.

Owner's Annual Inspection Record

It is the responsibility of the owner to arrange quarterly and annual inspections of the aerial platform. Table 1.1. Owner's Annual Inspection Record is to be used for recording the date of the inspection, owner's name, and the person responsible for the inspection of the work platform.

Replacement Parts

Use only original replacement parts. Parts such as batteries, wheels, railings, etc. with weight and dimensions different from original parts will affect stability of the aerial platform and must not be used without manufacturer's consent.

All replacement tires must be of the same size and load rating as originally supplied tires; to maintain safety and stability of aerial platform.

Consult SKYJACK's Service Department for optional tires specifications and installation.

⚠ WARNING

Any unit that is damaged or not operating properly must be immediately tagged and removed from service until proper repairs are completed.

Maintenance and Service Safety Tips

Maintenance and repair should only be performed by personnel who are trained and qualified to service this aerial platform.

All maintenance and service procedures should be performed in a well lighted and well ventilated area.

Anyone operating or servicing this aerial platform must read and completely understand all operating instructions and safety hazards in this manual and operating manual.

All tools, supports and lifting equipment to be used must be of proper rated load and in good working order before any service work begins. Work area should be kept clean and free of debris to avoid contaminating components while servicing.

All service personnel must be familiar with employer and governmental regulations that apply to servicing this type of equipment.

Keep sparks and flames away from all flammable or combustible materials.

Properly dispose of all waste material such as lubricants, rags, and old parts according to the relative law provisions obtaining in the country.

Before attempting any repair work, turn Battery Disconnect Switch to the "OFF" position.

Preventive maintenance is the easiest and least expensive type of maintenance.

Hydraulic System & Component Maintenance and Repair

The following points should be kept in mind when working on the hydraulic system or any component:

1. Any structure has limits of strength and durability. To prevent failure of structural parts of hydraulic components, relief valves which limit pressure to safe operating values are included in the hydraulic circuits.

2. Tolerance of working parts in the hydraulic system is very close. Even small amounts of dirt or foreign materials in the system can cause wear or damage to components, as well as general faulty operation of the hydraulic system. Every precaution must be taken to assure absolute cleanliness of the hydraulic oil.

3. Whenever there is a hydraulic system failure which gives reason to believe that there are metal particles or foreign materials in the system, drain and flush the entire system and replace the filter cartridges. A complete change of oil must be made under these circumstances.

4. Whenever the hydraulic system is drained, check the magnets in the hydraulic reservoir for metal particles. If metal particles are present, flush the entire system and add a new change of oil. The presence of metal particles also may indicate the possibility of imminent component failure. A very small amount of fine particles is normal.

5. All containers and funnels used in handling hydraulic oil must be absolutely clean. Use a funnel when necessary for filling the hydraulic oil reservoir, and fill the reservoir only through the filter opening. The use of cloth to strain the oil should be avoided to prevent lint from getting into the system.

6. When removing any hydraulic component, be sure to cap and tag all hydraulic lines involved. Also, plug the ports of the removed components.

NOTE

Samples of hydraulic oil should be drawn from the reservoir and tested annually. These samples should be taken when the oil is warmed through normal operation of the system. The sample should be analyzed by a qualified lubrication specialist to determine if it is suitable for continued use.

Oil change intervals will depend on the care used in keeping the oil clean, and the operating conditions. Dirt and/or moisture cotamination will dictate that the oil should be changed more often. Under normal use and operating conditions, the hydraulic oil should be changed every two years. Refer to Table 1.2 of this manual.

7. All hydraulic components must be dis-assembled in spotlessly clean surroundings. During disassembly, pay particular attention to the identification of parts to assure proper reassembly. Clean all metal parts in a clean mineral oil solvent. Be sure to thoroughly clean all internal passages. After the parts have been dried thoroughly, lay them on a clean, lint-free surface for inspection.

8. Replace all O-rings and seals when overhauling any component. Lubricate all parts with clean hydraulic oil before reassembly. Use small amounts of petroleum jelly to hold O-rings in place during assembly.

9. Be sure to replace any lost hydraulic oil when completing the installation of the repaired component, and bleed any air from the system when required.

10. All hydraulic connections must be kept tight. A loose connection in a pressure line will permit the oil to leak out or air to be drawn into the the system. Air in the system can cause damage to the components and noisy or erratic system operation.

Maintenance Hints

Three simple maintenance procedures have the greatest effect on the hydraulic system performance, efficiency and life. Yet, the very simplicity of them may be the reason they are so often overlooked. What are they? Simply these:

1. Change filters annually. The filters will need to be changed more often depending on the operating conditions. Dirty, dusty, high moisture environments may cause the hydraulic system to be contaminated more quickly.
2. Maintain a sufficient quantity of clean hydraulic oil of the proper type and viscosity in the hydraulic reservoir.
3. Keep all connections tight.

About this Section

This section contains the maintenance and inspection schedule that is to be performed.

References are made to the procedures in Section 5 that outline detailed step-by-step instructions for checks and replacements.

Service Bulletins

Before performing any scheduled maintenance inspection procedure, refer to service bulletins found in our web site: www.skyjackinc.com for updates related to service and maintenance of this aerial platform.

Maintenance and Inspection

Death or injury can result if the aerial platform is not kept in good working order. Inspection and maintenance should be performed by competent personnel who are trained and qualified on mantenance of this aerial platform.

WARNING

Failure to perform each procedure as presented and scheduled may cause death, serious injury or substantial damage.

NOTE

Preventive maintenance is the easiest and least expensive type of maintenance.

- Unless otherwise specified, perform each maintenance procedure with the aerial platform in the following configuration:

  - Aerial platform parked on a flat and level surface
  - Disconnect the battery by turning the main power disconnect switch to the “OFF” position.

- Repair any damaged or malfunction components before operating aerial platform.
- Keep records on all inspections.

Maintenance Instructions

This manual consists of four schedules to be done for maintaining on an aerial platform. Inspection schedule frequency is shown below:

Inspection Schedule

Daily	A
Frequently	A + B
Annually	A + B + C
Bi-annually	A + B + C + D

- Make copies of the maintenance and inspection checklist to be used for each inspection.
- Check the schedule on the checklist for the type of inspection to be performed.
- Place a check in the appropriate box after each inspection procedure is completed.
- Use the maintenance and inspection checklist and step-by-step procedures in Section 5 to perform these inspections.
- If any inspection receives a fail, tag and remove the aerial platform from service.
- If any aerial platform component(s) has been repaired, an inspection must be performed again before removing the tag. Place a check in the repair column.

Legend

P = Pass
F = Fail
R = Repaired

Table 1.1 Owner's Annual Inspection Record

Model Number: ____________					Serial Number: ____________					
Inspection Date										
Recording Year	New	1	2	3	4	5	6	7	8	9
Owner's Name	Skyjack Inc.									
Inspected By	Skyjack Inc.									

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As described earlier in this section, this decal is located on the scissor assembly. It must be completed after an annual inspection has been completed. Do not use the aerial platform if an inspection has not been recorded in the last 6 months.

Table 1.2 MAINTENANCE AND INSPECTION CHECKLIST

Serial Number: ______________________

Model: ______________________

Hourmeter Reading: ______________________ Name (Printed): ______________________

Date: ______________________

Time: ______________________ Signature: ______________________

Each item shall be inspected using the the appropriate section of the Skyjack operating manual.
As each item is inspected, write the apropriate grade in the box.

P - PASS
F - FAIL
R - REPAIRED

INSPECTION FREQUENCY

❑ DAILY
❑ FREQUENTLY
❑ ANNUALLY
❑ BI-ANNUALLY

Inspection Schedule	
Daily	A
Frequently*†	A + B
Annually†	A + B + C
Bi-annually†	A + B + C + D

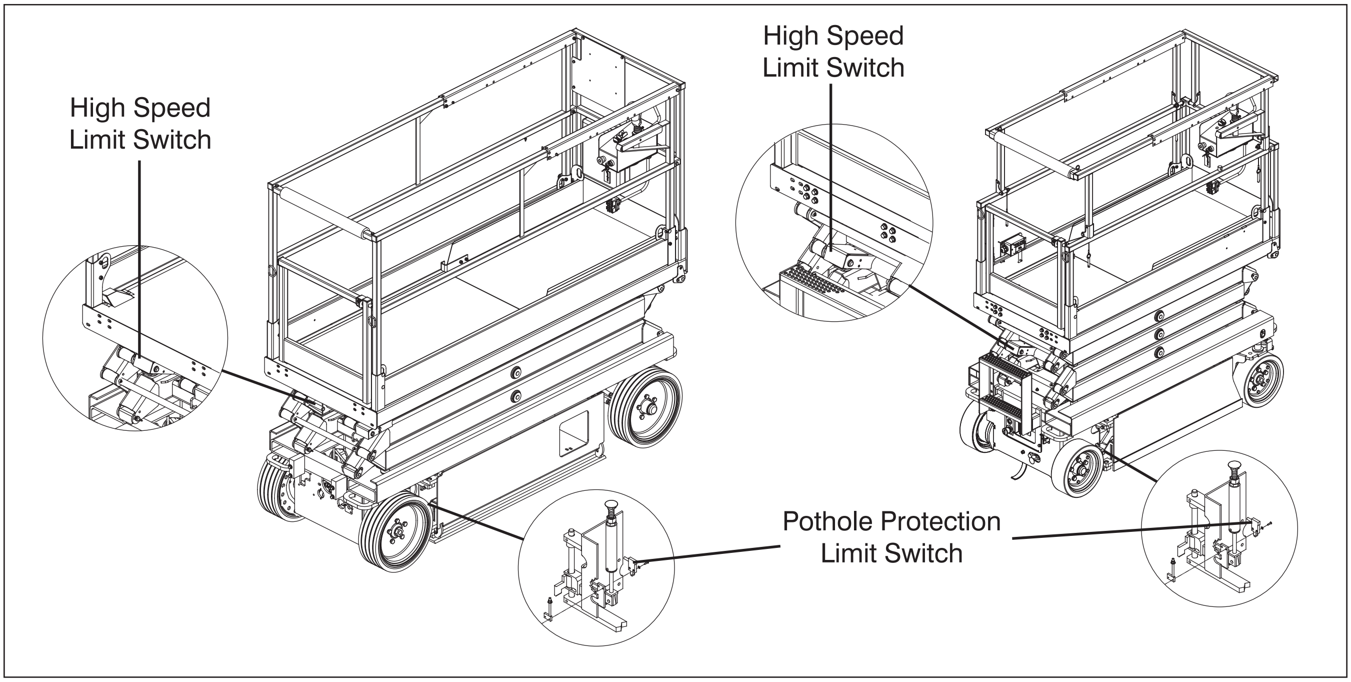
Schedule		P	F	R
Schedule Maintenance Inspections				
Labels	A			
Limit Switches	A, B			
Entrance Side				
Main Power Disconnect Switch	A, B			
Base Control Switches	A, B			
Free-wheeling Valve Knob (Compacts - Front Side)	A, B			
Brakes	A, B, C			
AC Outlet Receptacle	A, B			
Ladder	A, B			
Battery Tray Side				
Pothole Protection Device	A, B			
Battery Tray	A, B			
Battery Charger	A, B			
Battery	A, B			
Steer Cylinder Assembly	A, B			
Wheel/Tire Assembly	A, B			
Tie Rod (Conventionals)	A, B			
Greasing Points	A, B, C			
Hydraulic/Electric Tray Side				
Pothole Protection Device	A, B			
Hydraulic Tank	A, B, C			
Hydraulic Oil	A, B, C			
Hydraulic Pump and Motor	A, B			
Electrical Panel	A, B			
Proportional and Main Manifolds	A, B			
Load/Tilt Sensor	A, B			
Emergency Lowering Access Rod (If Equipped)	A, B			

Schedule		P	F	R
Platform Assembly				
Lanyard Attachment Anchors	A, B			
AC Outlet on Platform	A, B			
Platform Control Console	A, B			
Manuals	A, B			
Powered Extension Control Console (If Equipped)	A, B			
Lift Mechanism				
Maintenance Support	A, B			
Scissor Assembly	A, B			
Scissor Bumpers	A, B			
Rollers	A, B			
Lift Cylinder(s)	A, B			
Function Tests				
Test Main Power Discconect Switch	A, B			
Base Control Console				
Test Base Emergency Stop	A, B			
Test Off/Platform/Base	A, B			
Test Lower/Neutral/Raise Switch	A, B			
Test Emergency Lowering	A, B			
Test Free-wheeling	A, B			
Platform Control Console				
Test Platform Emergency Stop	A, B			
Test Enable Trigger Switch	A, B			
Test Steering	A, B			
Test Driving	A, B			
Test Brakes	A, B			
Test Platform Raising/Lowering	A, B			
Test Lowering Warning	A, B			
Test Horn	A, B			
Test Pothole Sensor	A, B			
Test Elevated Drive Speed	A, B			

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A - Perform Visual and Daily Maintenance Inspections & Functions Test. Refer to Section 2 of the Operating Manual.
B - Perform Scheduled Maintenance Inspection every three months or 150 hrs. Refer to Section 1 of this manual.
C - Perform Scheduled Maintenance Inspection every year. Refer to Section 1 of this manual.
D - Perform Scheduled Maintenance Inspection every 2 years. Refer to Section 1 of this manual.
***** Perform scheduled inspection every three months or 150 hours.
† - Refer to Skyjack's website @ www.skyjack.com for latest service bulletins porior to performing quarterly or yearly inspection.

Note: Make a copy of this page or visit the Skyjack web site:www.skyjack.com for a printable copy.



1.1 Scheduled Maintenance Inspections

Begin the scheduled maintenance inspections by checking each item in sequence for the conditions listed in this section.

WARNING

To avoid injury, do not operate an aerial platform until all malfunctions have been corrected.

WARNING

To avoid possible injury, ensure aerial platform power is off during your visual and daily maintenance inspections.

Electrical

Maintaining the electrical components is essential to good performance and service life of the aerial platform.

Inspect the following areas for chafed, corroded and loose wires:

- base to platform cables and wiring harness
- battery tray wiring harnesses
- hydraulic/electrical wiring harnesses

Hydraulic

Maintaining the hydraulic components is essential to good performance and service life of the aerial platform.

Perform a visual inspection around the following areas:

- hoses and fittings
- all hydraulic cylinders
- all hydraulic manifolds
- the underside of the base
- ground area under the aerial platform

1.1-1 Labels

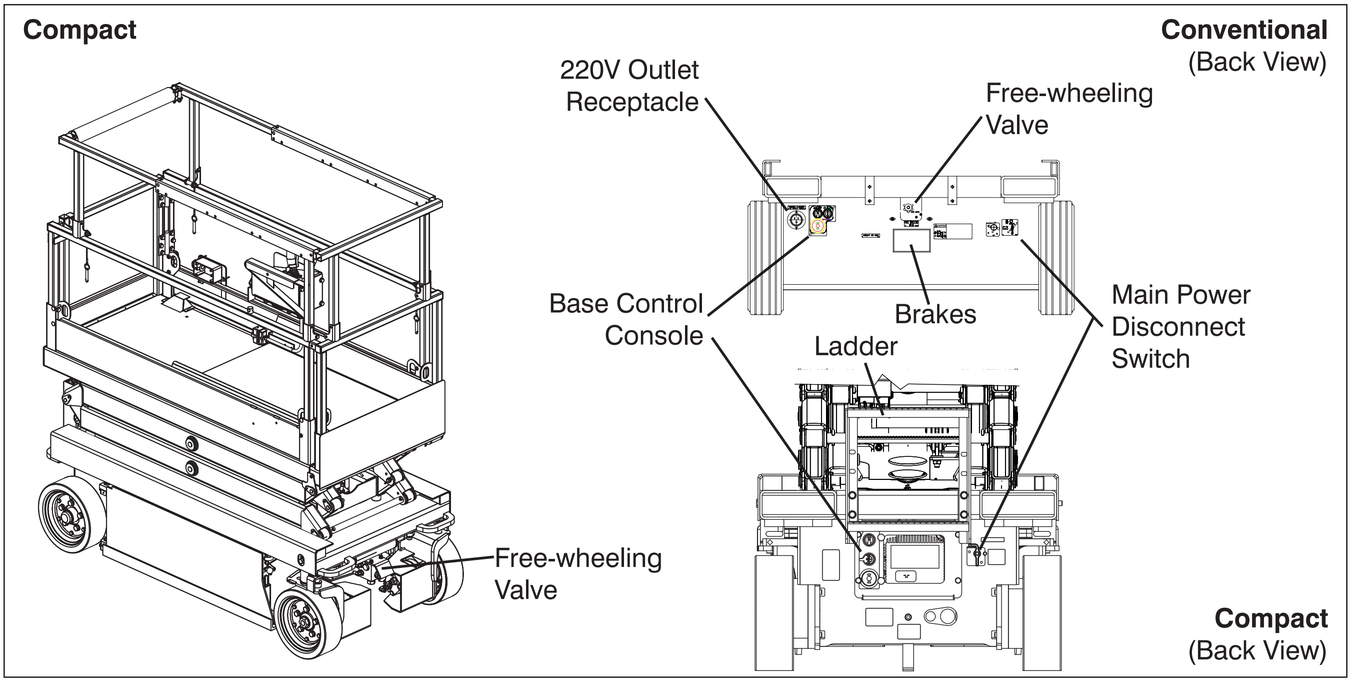
Refer to the labels section in this manual and determine that all labels are in place and are legible.

1.1-2 Limit Switches

Detecting limit switch malfunction is essential to safe aerial platform operation. Ensure limit switches are properly secured and movement is not obstructed.

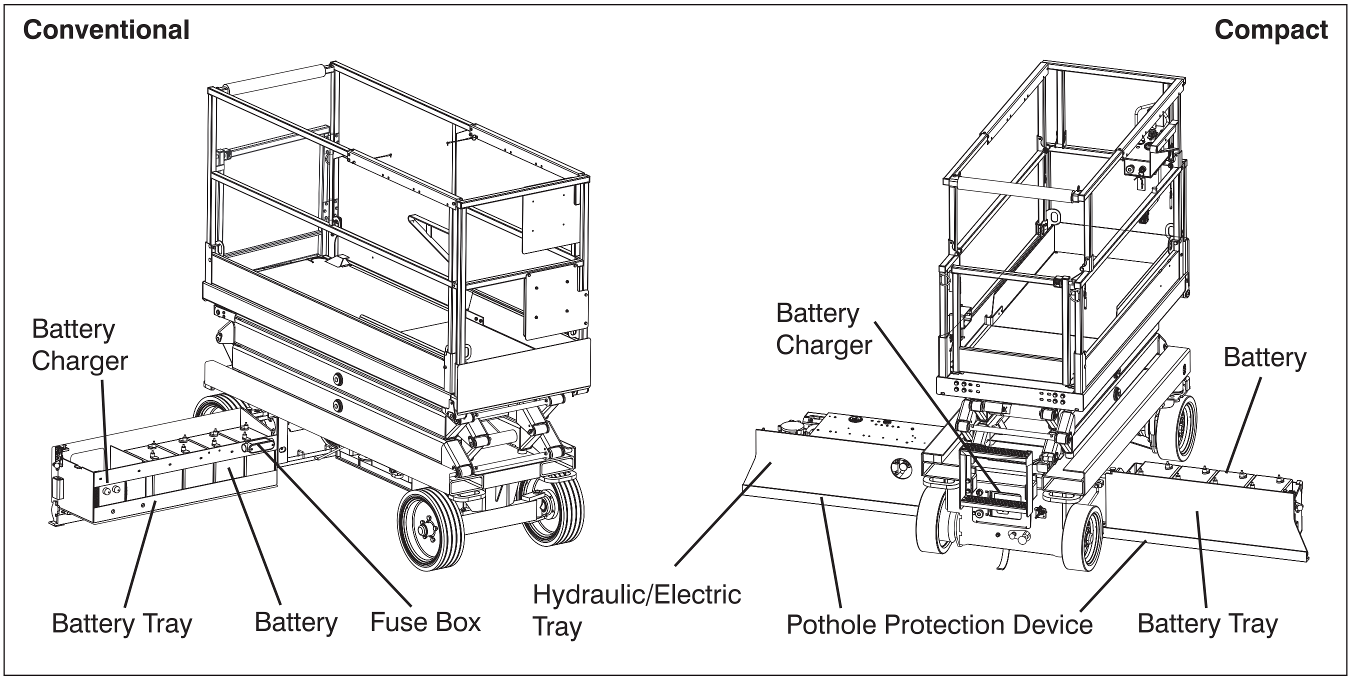
Visually inspect all limit switch located inside the scissor arms and the outrigger assemblies for the following:

- broken or missing actuator arm
- missing fasteners
- loose wiring



1.1-3 Entrance Side

- **Main Power Disconnect Switch**
  - Turn main power disconnect switch to "◯" off position.
  - Ensure all cables are secure and switch is in proper working condition.
- **Base Control Switches**
  - Ensure there are no signs of visible damage and all switches are in their neutral positions.
- **Free-wheeling Valve Knob**
  (Compacts - Front Side)
  - Ensure there are no loose or missing parts and there is no visible damage.
- **Brakes**
  - Ensure there are no loose or missing parts and there is no visible damage.
- **AC Outlet Receptacle**
  - Ensure receptacle is free from dirt and obstructions.
- **Ladder**
  - Ensure there are no loose or missing parts and there is no visible damage.



1.1-4 Battery Tray Side

- **Pothole Protection Device**
  - Ensure mechanisms have no sign of visible damage and are free from dirt and obstructions.
- **Battery Tray**
  - Ensure tray latch is secure and in proper working order.
- **Battery Charger**
  (Compacts - Entrance Side)
  - Ensure charger is secure and shows no visible damage.
- **Battery**
  Proper battery condition is essential to good performance and operational safety. Improper fluid levels or damaged cables and connections can result in component damage and hazardous conditions.

WARNING

Explosion hazard. Keep flames and sparks away. Do not smoke near batteries.



WARNING

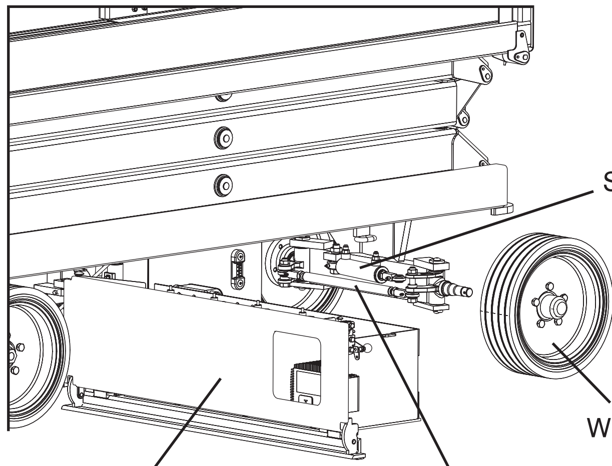
Battery acid is extremely corrosive - Wear proper eye and facial protection as well as appropriate protective clothing. If contact occurs, immediately flush with cold water and seek medical attention.

1. Check battery case for damage.
2. Clean battery terminals and cable ends thoroughly with a terminal cleaning tool or wire brush.
3. Ensure all battery connections are tight.
4. If applicable, check battery fluid level. If plates are not covered by at least 13 mm of solution, add distilled or demineralized water.
5. Replace battery if damaged or incapable of holding a lasting charge.

WARNING

Use original or manufacturer-approved parts and components for the aerial platform.

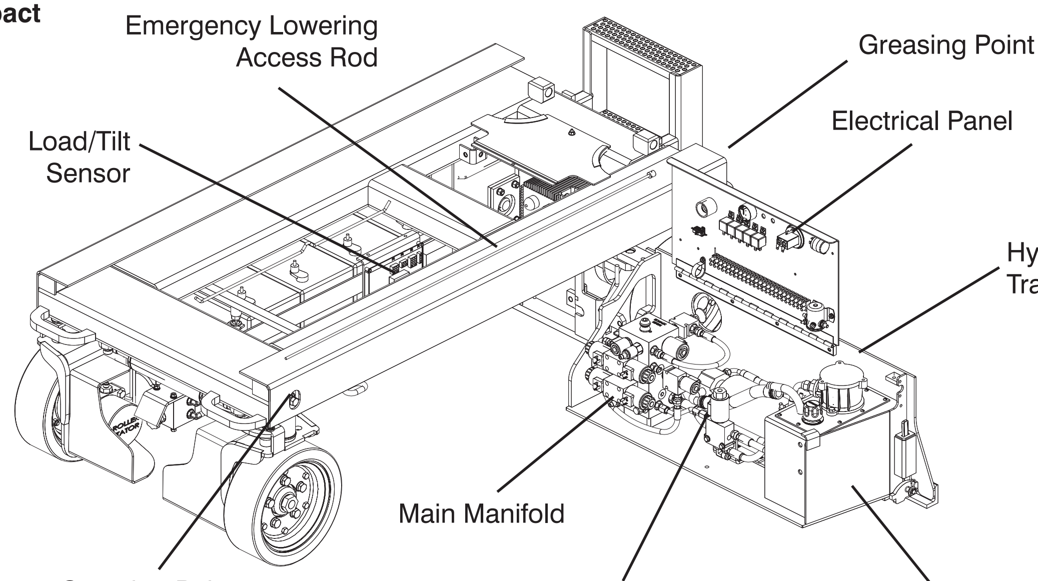
Conventional



- **Steer Cylinder Assembly**
  - Ensure steer cylinder assembly is properly secured and there are no loose or missing parts.
- **Wheel/Tire Assembly**
  The aerial platform is either equipped with solid rubber tires or foam-filled tires. Tire and/or wheel failure could result in an aerial platform tip-over. Component damage may also result if problems are not discovered and repaired in a timely fashion.
  - Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.
  - Check each wheel for damage and cracked welds.
  - Check each lug nut for proper torque to ensure none are loose.
  - Check wheel motor assembly for loose or missing parts and signs of visible damage.
  - Ensure wheels are aligned and true vertically and horizontally.
- **Tie Rod (Conventionals)**
  - Ensure there are no loose or missing parts, tie rod end studs are locked and there is no visible damage.
- **Greasing Points**
  - Ensure greasing points have no sign of visible damage and are free from dirt and obstructions.

B - Frequent Inspection

- Locate grease fittings and pump grease as needed.



1.1-5 Hydraulic/Electric Tray Side

- Ensure tray latch is secure and in proper working order.

- **Pothole Protection Device**
  - Ensure mechanisms have no sign of visible damage and are free from dirt and obstructions.

- **Hydraulic Tank**
  - Ensure hydraulic filler cap is secure.
  - Ensure tank shows no visible damage and no evidence of hydraulic leakage.

- **Hydraulic Oil**
  - Ensure platform is fully lowered, and then visually inspect the sight gauge located on the side of the hydraulic oil tank.
  - The hydraulic oil level should be at or slightly above the top mark of the sight glass.

C - Annual Inspection

- Refer to Section 1 - Hydraulic System & Component Maintenance and Repair.

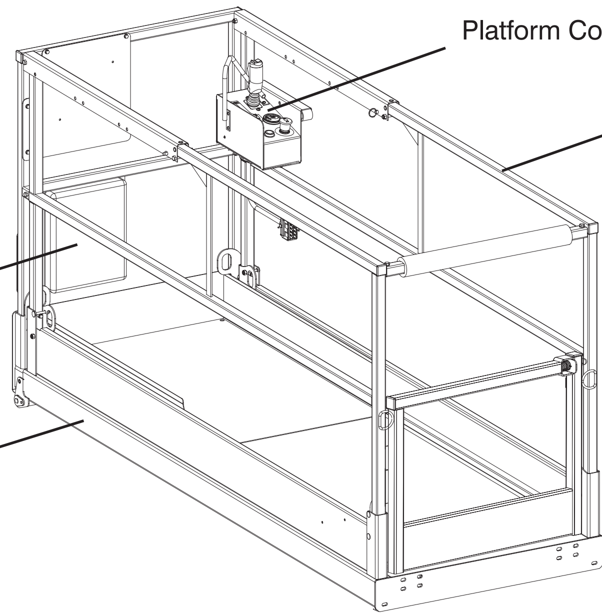
- **Hydraulic Pump and Motor**
  - Ensure there are no loose or missing parts and there is no visible damage.

- **Electrical Panel**
  - Ensure panel is properly secured and there is no visible damage.
  - Ensure there are no loose wires or missing fasteners.

- **Proportional and Main Manifolds**
  - Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.
  - Ensure there are no loose wires or missing fasteners.

- **Load/Tilt Sensor**
  - Ensure load/tilt sensor is properly secured and there is no visible damage.

- **Emergency Lowering Access Rod (If Equipped)**
  - Ensure rod is properly secured and there is no visible damage.



1.1-6 Platform Assembly

WARNING

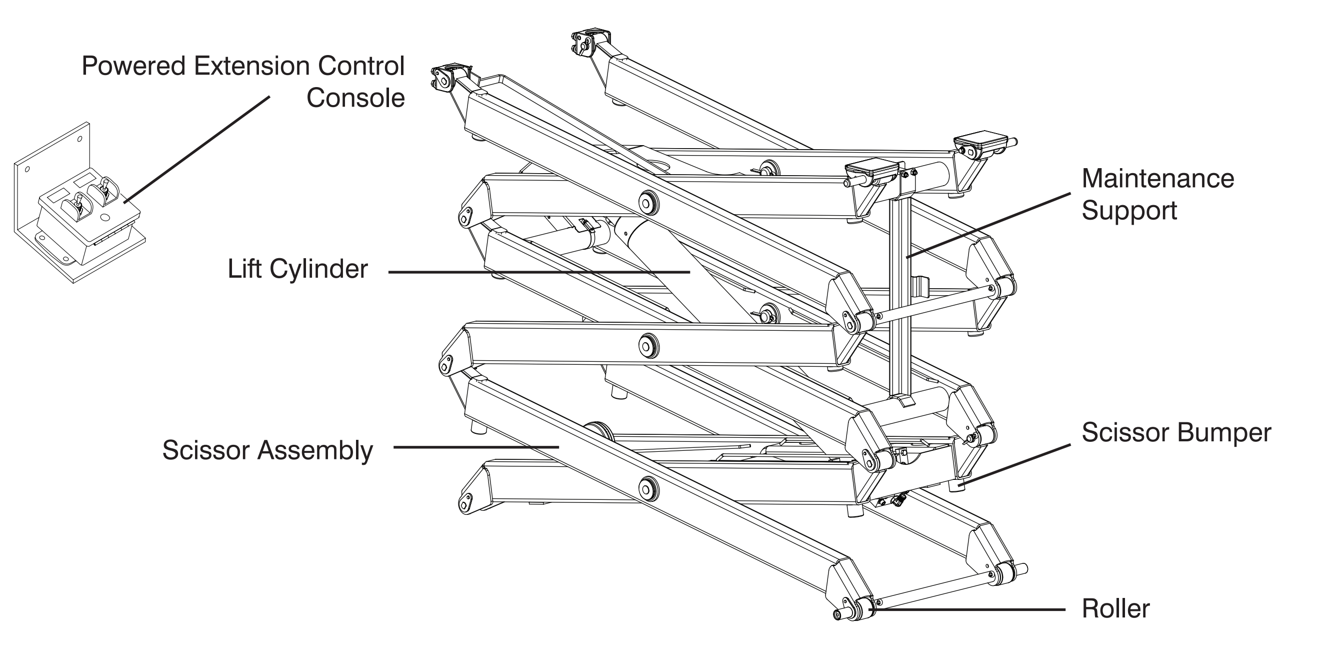
Ensure that you maintain three points of contact to mount/dismount platform.

1. Use the ladder of aerial platform to access platform.

2. Close the gate.

   - Ensure there are no loose or missing parts and there is no visible damage.
   - Ensure all fasteners are securely in place.
   - Ensure all railings are properly positioned and secured.
   - Ensure gate is in good working order.

- **Lanyard Attachment Anchors**
  - Ensure attachment rings are secure and no visible damage.
- **AC Outlet on Platform**
  - Ensure outlet has no visible damage and free from dirt or obstructions.
- **Platform Control Console**
  - Ensure all switches and controller are returned to neutral and are properly secured.
  - Ensure there are no loose or missing parts and there is no visible damage.
- **Manuals**
  Ensure a copy of operating manual and other important documents are enclosed in manual storage box.
  - Check to be sure manual storage box is present and in good condition.
  - Ensure manuals are legible and in good condition.
  - Always return manuals to the manual storage box after use.



- **Powered Extension Control Console (If Equipped)**
  - Ensure all switches are returned to neutral and are properly secured.
  - Ensure there are no loose or missing parts and there is no visible damage.

WARNING

Ensure that you maintain three points of contact to mount/dismount platform.

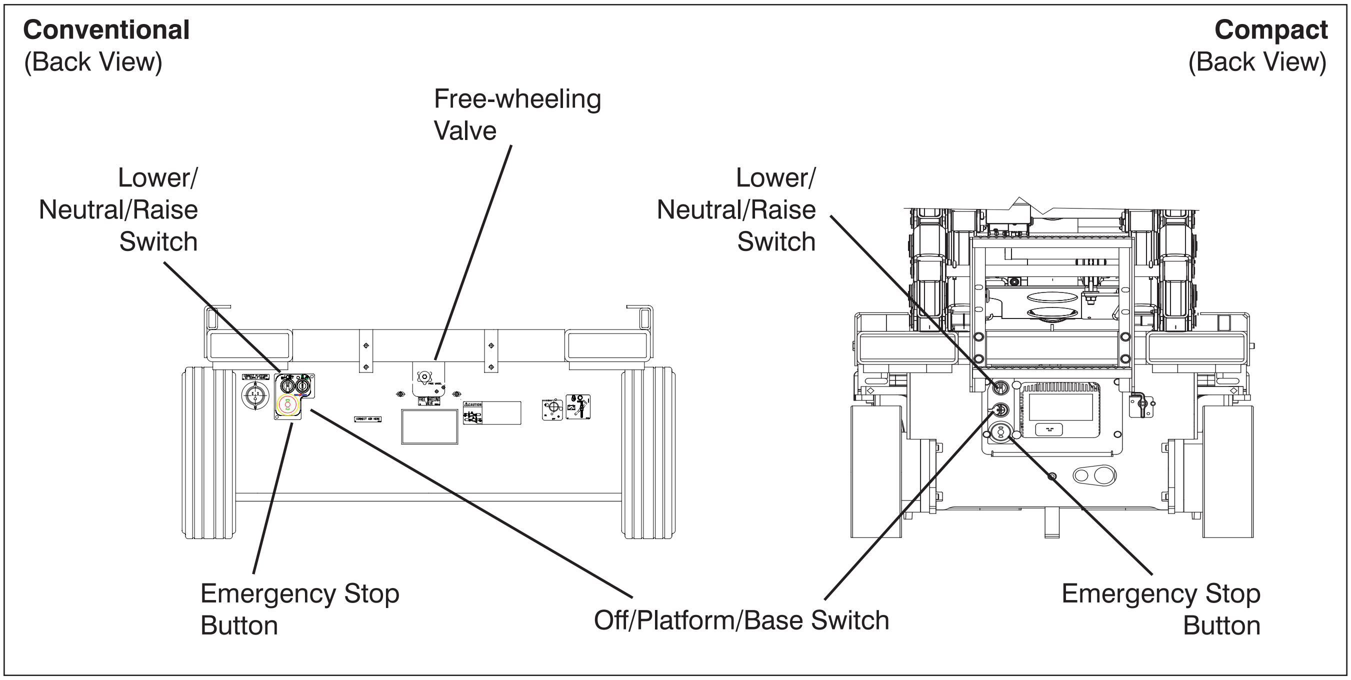
3. Use the ladder to dismount from platform.

1.1-7 Lifting Mechanism

1. Raise the platform until there is adequate clearance to swing down the maintenance support.

- **Maintenance Support**
  - Ensure maintenance support is properly secured and shows no visible damage.
- **Scissor Assembly**
  - Ensure scissor assembly shows no visible damage and no signs of deformation in weldments.
  - Ensure all pins are properly secured.
  - Ensure cables and wires are properly routed and shows no signs of wear and/or physical damage.
- **Scissor Bumpers**
  - Ensure bumpers are secure and shows no sign of visible damage.
- **Rollers**
  - Ensure rollers are secure and there is no visible damage.
  - Ensure rollers' path of travel are free from dirt and obstructions.
- **Lift Cylinder(s)**
  - Ensure each lift cylinder is properly secured, there are no loose or missing parts and there is no evidence of damage.
  - Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.

2. Raise the platform until there is adequate clearance to swing up the maintenance support.
3. Swing up maintenance support into storage bracket.
4. Fully lower the platform.



1.2 Function Tests

Function tests are designed to discover any malfunctions before aerial platform is put into service. The operator must understand and follow step-by-step instructions to test all aerial platform functions.

WARNING

Never use a malfunctioning aerial platform. If malfunctions are discovered, aerial platform must be tagged and placed out of service. Repairs to aerial platform may only be made by a qualified service technician.

After repairs are completed, operator must perform a pre-operation inspection and a series of function tests again before putting aerial platform into service.

Prior to performing function tests, be sure to read and understand Section 2.10 - Start Operation of the operating manual.

1.2-1 Test Main Power Disconnect Switch

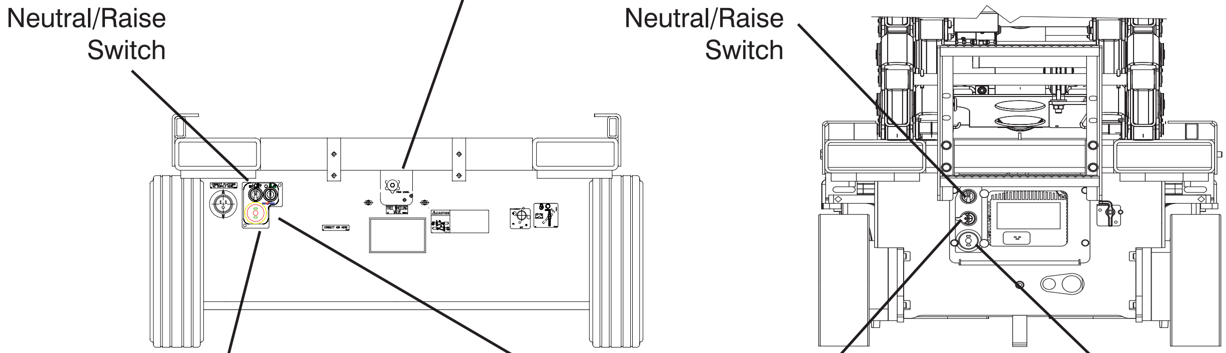
1. At rear of the base, turn main power disconnect switch to "◯" off position.
   Result: Aerial platform functions should not operate.

1.2-2 Base Control Console

WARNING

Ensure that you maintain three points of contact when using the ladder to mount/ dismount platform.

1. Use the ladder of aerial platform to access platform.
2. Close the gate.
3. On platform control console, pull out "●" emergency stop button.
4. Use the ladder to dismount from platform.
5. Turn main power disconnect switch to "|" on position.



- **Test Base Emergency Stop**

1. Push in "" emergency stop button and attempt to raise or lower the platform.
Result: Platform raising and lowering functions should not operate.

2. Pull out base "" emergency stop button.

- **Test Off/Platform/Base Switch**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

1. Select off/platform/base key switch "" off position. Attempt to raise or lower the platform.
Result: Platform raising and lowering functions should not operate.

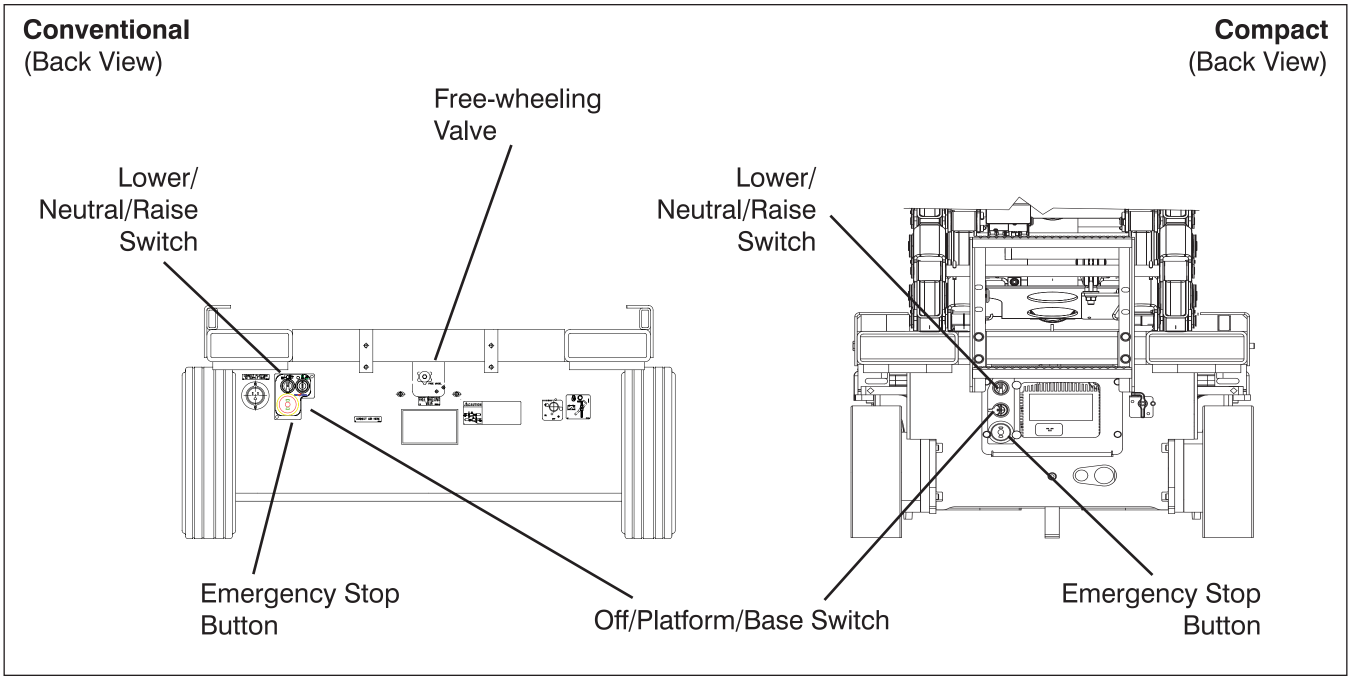
2. Select off/platform/base key switch to "" platform position. Attempt to raise or lower the platform.
Result: Platform raising and lowering functions should not operate.

3. Select and hold off/platform/base key switch to "" base position. Attempt to raise or lower the platform.
Result: Platform raising and lowering functions should operate.

- **Test Lower/Neutral/Raise Switch**

1. Select and hold off/platform/base key switch to "" base position and "" raise the platform with lower/neutral/raise switch.
Result: Platform should rise.

2. Select and hold off/platform/base key switch to "" base position and "" lower the platform with lower/neutral/raise switch.
Result: Platform should lower.

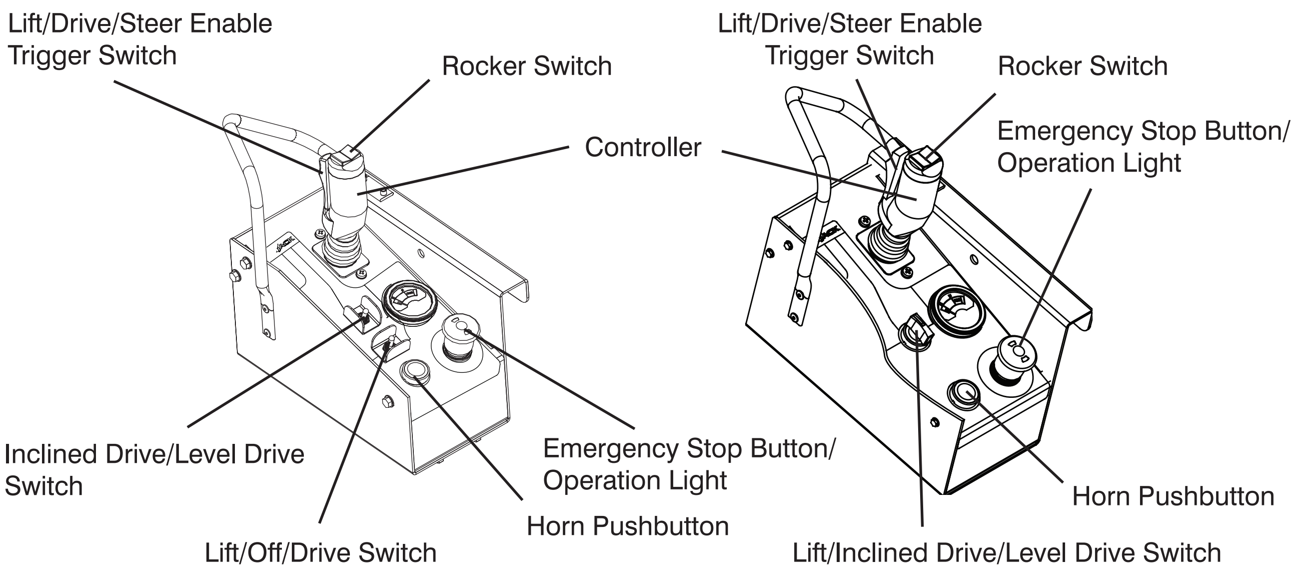


- **Test Emergency Lowering**

1. Raise the platform.
2. Locate holding valve manual override knob at the base of each lift cylinder. Depress and turn counterclockwise. If necessary, use access rod that is located on the base of the aerial platform.
3. On hydraulic/electric tray, pull out and hold emergency lowering valve to fully lower the platform.
   Result: The platform should lower.
4. To restore normal operation, depress and turn holding valve manual override knobs clockwise.

- **Test Free-wheeling**

1. Ensure path of intended motion is clear.
2. Release the brake manually.
3. Turn free-wheeling valve knob counterclockwise to a fully opened position and attempt to push/pull the aerial platform.
   Result: Platform should move.
4. Turn free-wheeling valve knob clockwise to a fully closed position for normal operation.
5. Reengage the brake.



Platform Control Console with Toggle Switch **Platform Control Console with Rotary Switch**

1.2-3 Platform Control Console

1. Ensure base "●" emergency stop button is pulled out.
2. Select off/platform/base key switch to "[platform symbol]" platform position.
3. Ensure main power disconnect switch is in "|" on position.

⚠ **WARNING**

Ensure that you maintain three points of contact when using the ladder to mount/ dismount platform.

4. Use the ladder of aerial platform to access platform.
5. Close the gate.
6. On platform control console, pull out "●" emergency stop button.

- **Test Platform Emergency Stop**

  1. Push in "●" emergency stop button and attempt to activate any platform function.
     Result: All selected platform functions should not operate.

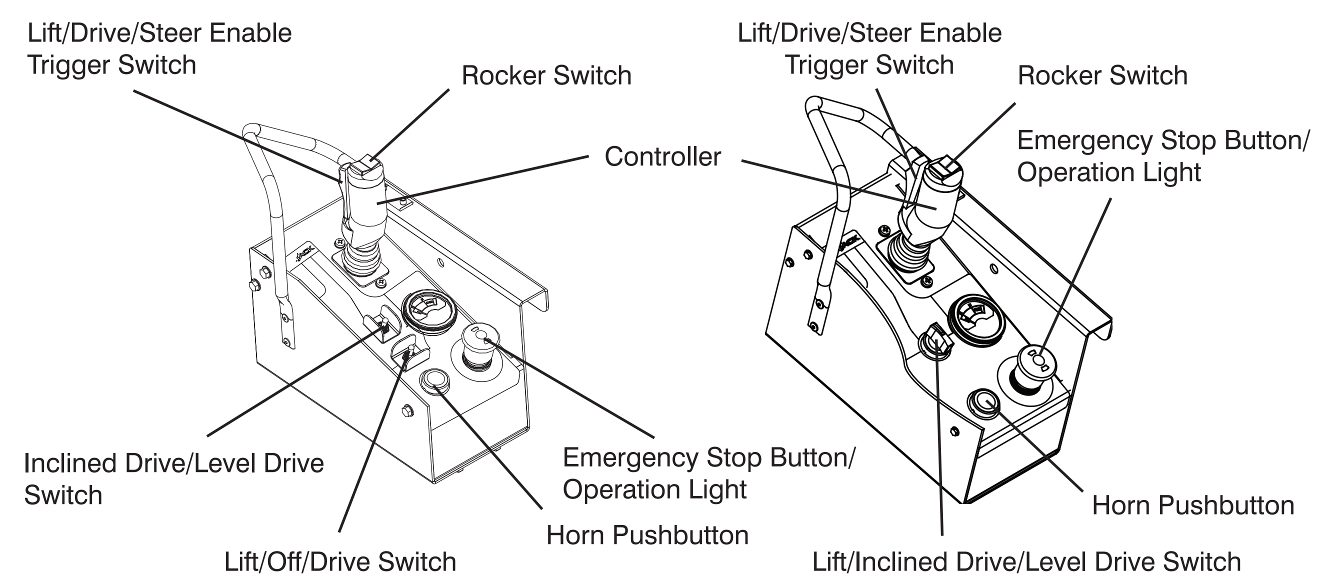
- **Test Enable Trigger Switch**

  1. Pull out "●" emergency stop button.
  2. Without activating "[enable trigger symbol]" enable trigger switch, attempt to activate any platform function.
     Result: All platform functions should not operate.

- **Test Steering**

  1. For platform control console with toggle switch:
     Select lift/off/drive switch to "[drive symbol]" drive position.

     For platform control console with rotary switch:
     Select lift/inclined drive/level drive switch to either "[inclined drive symbol]" inclined drive (low speed/ high torque) or "[level drive symbol]" level drive (high speed/low torque) position.
  2. Activate and hold "[enable trigger symbol]" enable trigger switch.



Platform Control Console with Toggle Switch **Platform Control Console with Rotary Switch**

3. Press rocker switch on top of controller handle to “ ” left and “ ” right.
   Result: Steer wheels should turn left and right.

- **Test Driving**

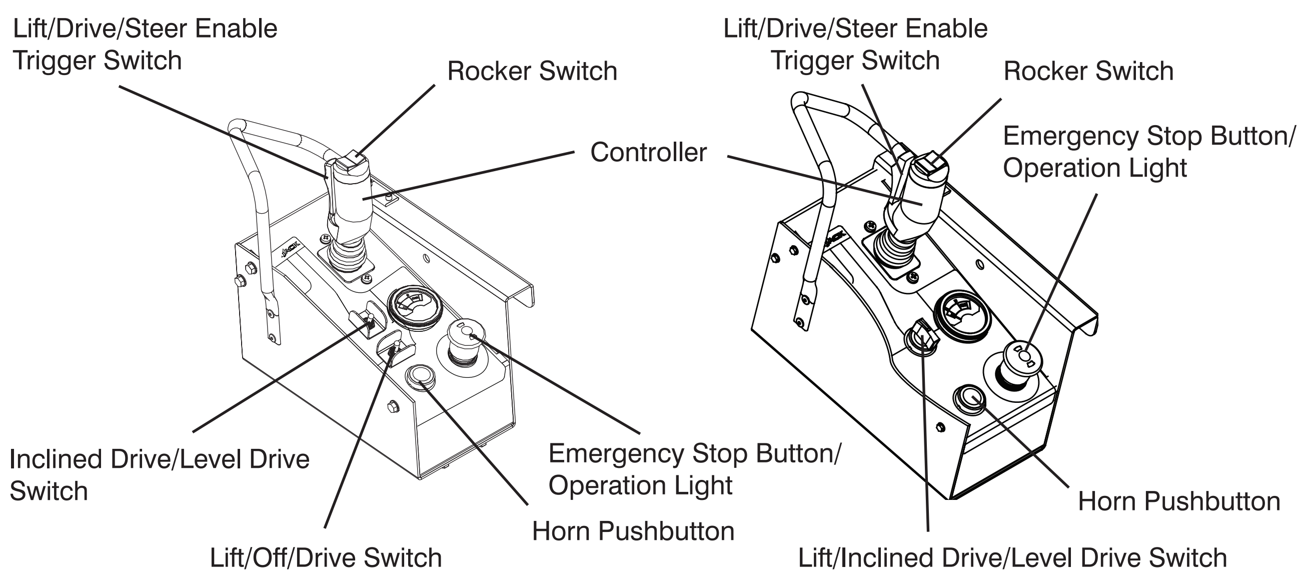
1. Ensure path of intended motion is clear.
2. Activate and hold “ ”enable trigger switch.
3. Slowly move controller handle in “ ” forward direction until aerial platform begins to move, and then return handle to center position.
   Result: Aerial platform should move in forward direction, and then come to a stop.
4. Slowly move controller handle in “ ” reverse direction until aerial platform begins to move, and then return handle to center position.
   Result: Aerial platform should move in reverse direction, and then come to a stop.

- **Test Brakes**

WARNING

Brakes will engage instantly when you release the controller handle, causing aerial platform to stop immediately.

1. Ensure path of intended motion is clear.
2. Activate and hold “ ” enable trigger switch.
3. Drive aerial platform “ ” forward and then “ ” backward. Test brake by releasing controller handle.
   Result: Aerial platform should come to a stop. If aerial platform pulls to one side while stopping, do not operate aerial platform until brake adjustments have been checked.
4. Drive aerial platform “ ” forward and then “ ” backward. Test brake again by releasing “ ” enable trigger switch only.
   Result: Aerial platform should come to an instant and abrupt stop. If aerial platform does not stop immediately, or if aerial platform pulls to one side while stopping, do not operate aerial platform until brake adjustments have been checked.



Platform Control Console with Toggle Switch **Platform Control Console with Rotary Switch**

- **Test Platform Raising/Lowering**

⚠ **WARNING**

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

1. Select lift/inclined drive/level drive switch to “ ” lift position.

2. Activate and hold “ ” enable trigger switch.

3. Push controller handle and raise the platform to an approximate height of 0.5 meter.
   Result: Platform should rise.

4. Pull conttroller handle and lower the platform fully.
   Result: Platform should lower.

- **Test Lowering Warning**

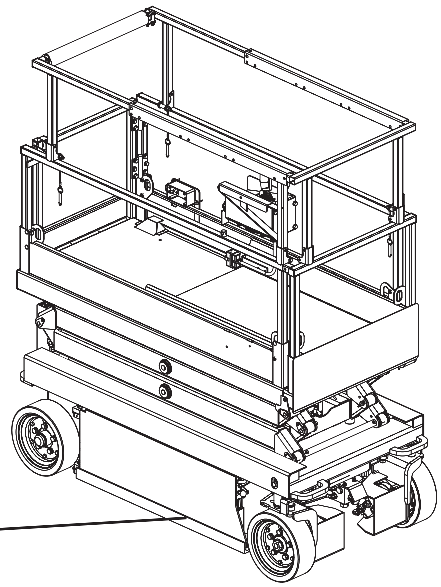
1. Raise the platform until approximately a height of 3 to 4 meters is reached then attempt to fully lower the platform.
   Result: Platform should stop lowering at a height of 2.5 meters high and an alarm should sound.

2. Release controller handle.

- **Test Horn**

1. Push “ ” horn pushbutton.
   Result: Horn should sound.

Compact



- **Test Pothole Sensor**

WARNING

Ensure that you maintain three points of contact to mount/dismount platform.

1. Use the ladder to dismount from platform and place a block, approximately 3.75 cm, under the hydraulic/electric tray.
2. Use the ladder of aerial platform to access platform.
3. Close the gate.
4. Raise the platform until approximately a height of 2 meters is reached and attempt to drive forward or reverse.
   Result: Aerial platform should not move forward or backward.
5. Repeat the steps above with block placed under battery tray.
   Result: Aerial platform should not move forward or backward.

- **Test Elevated Drive Speed**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

1. Ensure path of intended motion is clear.
2. Raise the platform until approximately a height of 2 meters is reached and attempt to drive forward or reverse.
   Result: Aerial platform should move slower than when it was in stowed position.

Section 2
MAINTENANCE TABLES AND DIAGRAMS

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Tables

2

Table 2.1 Specifications and Features

MODEL	3215	3219	3220	3226
Weight *	1120 kg	1312 kg	1599 kg	1891 kg
Overall width	0.81 m		0.83 m	
Overall length	1.80 m		2.34 m	
Platform Size (inside)	0.66 m x 1.63 m		0.70 m x 2.10 m	
Height				
Working Height	6.5 m	7.8 m	8.0 m	9.9 m
Platform Elevated Height	4.5 m	5.8 m	6.0 m	7.9 m
Stowed Platform Height	0.88 m	0.99 m	0.97 m	1.14 m
Stowed Height (Railings Up)	1.99 m	2.11 m	2.10 m	2.25 m
Drive Height	FULL			
Standard Operating Times				
Lift Time (No Load)	17 s	18 s	27 s	49 s
Lower Time (No Load)	36 s	39 s	40 s	57 s
Lift Time (Rated Load)	22 s	21 s	33 s	53 s
Lower Time (Rated Load)	29 s	35 s	28 s	44 s
Chassis				
Normal Drive Speed	3.7 km/h		3.2 km/h	3.2 km/h
Elevated Drive Speed	1.1 km/h		1.1 km/h	1.1 km/h
High Torque Drive Speed	N/A		1.8 km/h	1.8 km/h
Gradeability (Ramp Angle)	30%	25%	30%	
Tires (Solid Rubber)	12 x 4 x 8		16 x 5 x 12	
Hydraulic Oil				
Type	ATF Dexron III			
Tank Capacity (Liters)	10.9		30	

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* Weight with standard 0.9m extension platform. Refer to serial nameplate for specific applications.

Note :
Emission sound pressure level does not exceed 70 dB(A).

Table 2.1 Specifications and Features (Continued)

MODEL	4620	4626	4632
Weight *	1980 kg	2170 kg	2300 kg
Overall width	1.2 m		
Overall length	2.3 m		
Platform Size (inside)	1.1 m x 2.1 m		
Height			
Working Height	8.1 m	9.9 m	11.8 m
Platform Elevated Height	6.1 m	7.9 m	9.8 m
Stowed Platform Height	1.0 m	1.1 m	1.2 m
Stowed Height (Railings Up)	1.96 m	2.15 m	2.24 m
Stowed Height (Railings Down)	1.6m	1.8m	1.9 m
Drive Height	6.1 m	7.9 m	9.7 m
Standard Operating Times			
Lift Time (No Load)	24 s	48 s	50 s
Lower Time (No Load)	48 s	45 s	62 s
Lift Time (Rated Load)	32 s	54 s	59 s
Lower Time (Rated Load)	32 s	32 s	49 s
Chassis			
Normal Drive Speed	3.2 km/h		
Elevated Drive Speed	1 km/h		
High Torque Drive Speed	1.6 km/h		
Gradeability (Ramp Angle)	30%		25%
Tires (Solid Rubber)	16 x 5 x 12		
Hydraulic Oil			
Type	ATF Dexron III		
Tank Capacity (Liters)	30		

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* Weight with standard 1.2m extension platform. Refer to serial nameplate for specific applications.

Note :
Emission sound pressure level does not exceed 70 dB(A).

Table 2.2 Floor Loading Pressure

MODEL		Total Aerial Platform Weight	Total Aerial Platform Load		
			Wheel	LCP**	OUP**
		kg	kg	kPa (kN/m^2)	kPa (kN/m^2)
3215	min*	1120	448	685.9	7.7
	max*	1347	539	742.4	9.2
3219	min*	1312	525	743.4	9.0
	max*	1539	615	782.0	10.6
3220	min*	1542	616	758.5	8.5
	max*	1950	780	896.5	11.5
3226	min*	1896	746	827.5	10.0
	max*	2091	836	896.5	11.5
4620	min*	1922	744	1316.9	7.0
	max*	2568	1021	1530.6	9.5
4626	min*	2173	853	1420.3	8.0
	max*	2627	1075	1544.4	10.1
4632	min*	2303	921	1434.1	8.6
	max*	2620	1048	1537.5	9.8

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* **min** - Total aerial platform weight with no options

max - Aerial platform weight + all options + full capacity

** **LCP - Locally Concentrated Pressure** is a measure of how hard the aerial platform presses on the areas in direct contact with the floor. The floor covering (tile, carpet, etc.) must be able to withstand more that the indicated values above.

OUP - Overall Uniform Pressure is a measure of the average load the aerial platform imparts on the whole surface directly underneath it. The structure of the operating surface (beams, etc.) must be able to withstand more than the indicated values above.

NOTE:

The LCP or **OUP** that an individual surface can withstand varies from structure to structure and is generally determined by the engineer or architect for that particular structure.

Floor Loading Pressure

Locally Concentrated Pressure (LCP):

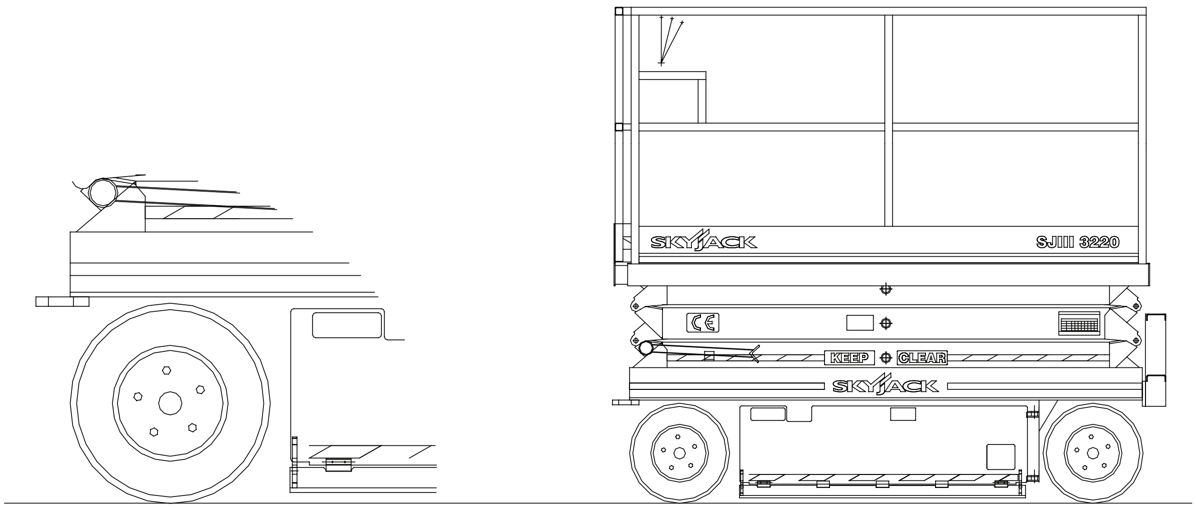
Foot Print Area = Length x Width

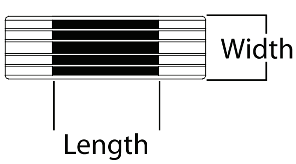
$$LCP = 0.4 \times \frac{\text{Weight of Aerial Platform + Capacity}}{\text{Foot Print Area}}$$

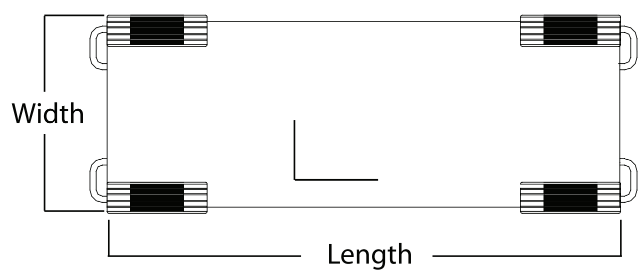
Overall Uniform Pressure (OUP):

Base Area = Length x Width

$$OUP = \frac{\text{Weight of Aerial Platform + Capacity}}{\text{Base Area}}$$







WARNING

Intermixing tires of different types or using tires of types other than those originally supplied with this equipment can adversely affect stability. Therefore, replace tires only with the exact original Skyjack-approved type. Failure to operate with matched approved tires in good condition may result in death or serious injury.

Table 2.3 Maximum Platform Capacities (Evenly Distributed)

MODEL	Manual Extension Platform				Powered Extension Platform				Maximum Wind Speed	Tilt Cutout Setting
	Total Capacity		Extension Capacity		Total Capacity		Extension Capacity			
3215	227 kg	2 Persons	113 kg	1 Person	N/A				No Wind	1.5 x 3.5
	227 kg	1 Persons	113 kg	1 Person					9.4 m/s	
3219	227 kg	2 Persons	113 kg	1 Person	N/A				No Wind	1.5 x 3.5
	227 kg	1 Persons	113 kg	1 Person					9.4 m/s	
3220	408 kg	2 Persons	113 kg	1 Person	408 kg	2 Persons	113 kg	1 Person	No Wind	1.5 x 3.5
3226	227 kg	2 Persons	113 kg	1 Person	N/A				No Wind	1.5 x 3.5
4620	590 kg	3 Persons	136 kg	1 Person	N/A				12.5 m/s	1.5 x 3.5
4626	454 kg	2 Persons	136 kg	1 Person	N/A				12.5 m/s	1.5 x 3.5
4632	317 kg	2 Persons	113 kg	1 Person	N/A				No Wind	1.5 x 3.5
	317 kg	1 Person	113 kg	1 Person					9.4 m/s	

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NOTE: Overall Capacity - Occupants and materials not to exceed rated load.

BEAUFORT SCALE	Wind Speed				Ground Conditions
	m/s	km/h	ft/s	mph	
3	3.4 – 5.4	12.5 – 19.4	11.5 – 17.75	8 – 12	Papers and thin branches move, flags wave
4	5.4 – 8.0	19.4 – 28.8	17.75 – 26.25	13 – 17	Dust is raised, paper whirls up, and small branches sway.
5	8.0 – 10.8	28.8 – 38.9	26.25 – 35.5	18 – 24.25	Shrubs with leaves start swaying. Wave crests are apparent in ponds or swamps.
6	10.8 – 13.9	38.9 – 50.0	35.5 – 45.5	24.5 – 31	Tree branches move. Power lines whistle. It is difficult to open an umbrella.
7	13.9 – 17.2	50.0 – 61.9	45.5 – 56.5	31 – 38.5	Whole trees sway. It is difficult to walk against the wind.

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WARNING

This aerial platform is equipped with a load sensing system. Do not exceed the rated capacity of the aerial platform. Failure to avoid this will prevent operation of all normal controls/functions of the aerial platform. To resume normal operation remove the additional loads.

AD

Table 2.4 Torque Specifications

Directional valve mounting bolts	28-32 in-lb	2.2 – 3.6 Nm
Wheel mounting bolts	90 ft-lb	122.02 Nm

Cartridge

	Size					
Torque	08	38	58	10	12	16
Ft-lb (max)	20	20	20	25	35	50
In-lb (max)	240	240	240	300	420	600
Nm (max)	27.12	27.12	27.12	33.90	47.46	67.80

Coils

	Size
Torque	All coils
Ft-lb (max)	4 to 5
In-lb (max)	48 to 60
Nm (max)	5.42 to 6.78

SAE Plugs

	Size							
Torque	2	4	5	6	8	10	12	16
Ft-lb (max)	3	10	15	15	25	25	30	35
In-lb (max)	36	120	180	180	300	300	360	420
Nm (max)	4.07	13.56	20.34	20.34	33.90	33.90	40.68	47.46

Newton-meter = Nm	**Foot-pound = ft-lb**	**Inch-pound = in-lb**

Additional Torque Specifications may be found in Section 3.

60056AF

Section 3
SYSTEM COMPONENT IDENTIFICATION AND SCHEMATICS

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Charts

Parts List

Diagrams and Schematics

3

3.1 Electrical Symbol Chart

CIRCUITS CROSSING NO CONNECTION	HOURMETER	KEY SWITCH	LIMIT SWITCH N.O.
CIRCUITS CONNECTED	LIGHT	FOOT SWITCH	LIMIT SWITCH N.O. HELD CLOSED
BATTERY	HYDRAULIC VALVE COIL	TOGGLE SWITCH	LIMIT SWITCH N.C.
GROUND	PROPORTIONAL HYDRAULIC VALVE COIL	PUSH BUTTON	LIMIT SWITCH N.C. HELD OPEN
FUSE	ELECTRIC MOTOR	ROTARY SWITCH	SILICON CONTROLLED RECTIFIER
CIRCUIT BREAKER	HORN	LIMIT SWITCH	PROXIMITY SWITCH
VOLT METER	EMERGENCY STOP BUTTON	CAM OPERATED LIMIT SWITCH	PNP TRANSISTOR
CAPACITOR	RESISTOR	VARIABLE RESISTOR	NPN TRANSISTOR
POTENTIOMETER	LEVEL SENSOR	SINGLE POLE SINGLE THROWN RELAY	PRESSURE/ VACUUM SWITCH
SINGLE POLE DOUBLE THROW RELAY	DOUBLE POLE SINGLE THROW RELAY	DOUBLE POLE DOUBLE THROW RELAY	TEMPERATURE SWITCH
TRIPLE POLE DOUBLE THROW RELAY	DIODE	RHEOSTAT	TILT SWITCH

3.2 Hydraulic Symbol Chart

LINE CROSSING	VARIABLE DISPLACEMENT PUMP	SHUTTLE VALVE	VELOCITY FUSE
LINE JOINED	HAND PUMP	ACCUMULATOR, GAS CHARGED	SINGLE ACTING CYLINDER
HYDRAULIC TANK	RELIEF VALVE	CUSHION CYLINDER	DOUBLE ACTING CYLINDER
HYDRAULIC FILTER WITH BYPASS	PRESSURE REDUCING VALVE	PRESSURE SWITCH	DOUBLE ACTING DOUBLE RODDED CYLINDER
ELECTRIC MOTOR	FIXED ORIFICE	MOTION CONTROL VALVE	SPRING APPLIED HYDRAULIC RELEASED BRAKE
ENGINE	ADJUSTABLE FLOW CONTROL	FLOW DIVIDER COMBINER	BRAKE CYLINDER
FIXED DISPLACEMENT PUMP	CHECK VALVE	COUNTER BALANCE VALVE	ROTARY ACTUATOR
VARIABLE DISPLACEMENT HYDRAULIC MOTOR	OIL COOLER	VALVE COIL	BI DIRECTIONAL HYDRAULIC MOTOR
SERIES PARALLEL HYDRAULIC MOTOR	TWO POSITION TWO WAY NORMALLY CLOSED VALVE	TWO POSITION THREE WAY VALVE	THREE POSITION FOUR WAY CLOSED CENTER OPEN PORT
TWO POSITION TWO WAY NORMALLY OPEN VALVE	TWO POSITION THREE WAY VALVE	THREE POSITION FOUR WAY CLOSED CENTER CLOSED PORT	
PRESSURE TRANSDUCER	MAIN LINES Solid	PILOT LINES Dashed	
SERVO	MOTOR/BRAKE		

3.3 Wire Number and Color Code

WIRE NO.	WIRE COLOR	WIRE NO.	WIRE COLOR	WIRE NO.	WIRE COLOR	WIRE NO.	WIRE COLOR	WIRE NO.	WIRE COLOR
00	WHT	20	ORG/BLU	44	YEL/WHT	67	ORG/BRN	92	GRN SHLD
000	WHT	21	WHT/RED	45	YEL/ORG	68	GREY	93	BLK SHLD
B1	BLU/PINK	23	BLK/WHT	46	RED/BLK	69	WHT/GRN	95	YEL/GREY
01	PUR/BLK	24	BLU/BLK	47	PUR/ORG	70	ORG/PINK	96	WHT/GREY
02	WHT	25	BRN/BLK	48	YEL/GREY	71	RED/ORG	97	ORG/GREY
03	GRN/PUR	26	BLU/YEL	49	GRN/RED	72	RED/BRN	98	RED SHLD
04	RED/YEL	27	RED/BLK/WHT	50	BRN	73	RED/PINK	98A	BLK SHLD
05	PUR	28	GRN	51	BLK/GRN	74	GRN/ GREY	99	BLK/GREY
06		29	GREY/ORG	52	GRN/BLU	75	GREY/PUR	103	BLK/PUR
07	RED	30	RED/GRN	53	BRN/RED	76	BRN/BLU	104	GRN/ORG
08	PUR/WHT	31	RED/WHT	54	PUR/RED	77	BRN/GREY	105	GRN/BRN
09	YEL	32	GRN/BLK	55	YEL/PUR	78	RED/BLU	106	GRN/PINK
10	BLU/WHT	33	GRN/WHT	56	YEL/BLK	79	BRN/PUR	107	BLK/BLU
11	WHT/ORG	34	ORG/BLK	57	BRN/GRN	80	GREY/ WHT	108	YEL/BRN
12	RED/YEL/ BLK	35	ORG/WHT	58	WHT/PUR	81	GREY/BLK	109	GRN/YEL
13	ORG	36	RED/PUR	59	YEL/BLU	82	BRN/WHT	110A	BLU
14	BLK	37	WHT/RED/ BLK	60	WHT/BLU	83	BLU/GREY	110B	BRN
15	BLU	38	ORG/RED	61	GREY/BRN	84	WHT/BLK/ PUR	111	GREY/GRN
16	WHT/BLK	39	BLK/RED	62	GREY/RED	85	GREY/BLU	112	BLU/ORG
17	BLU/GRN	40	BLU/RED	63	GREY/YEL	86/87	PUR/BLU	113	BLU/BRN
18	GRN/BLU	41	BLU/PUR	64	WHT/BRN	88	BLK/ORG	114	YEL/RED
19	ORG/GRN	42	PINK	65	YEL/PINK	90	RED/GREY	115	WHT/PUR
22	PUR/GRN	43	WHT/YEL	66	ORG/YEL	91	RED SHLD	118	PUR/PINK

This table is to be used as a wire number/color reference for all electrical drawings and schematics. All wire numbers will retain their origional color coding, for example if wire 7 is red, wire 7A, 7B, and 7C will also be red.

3.4 Hydraulic Schematic Parts List

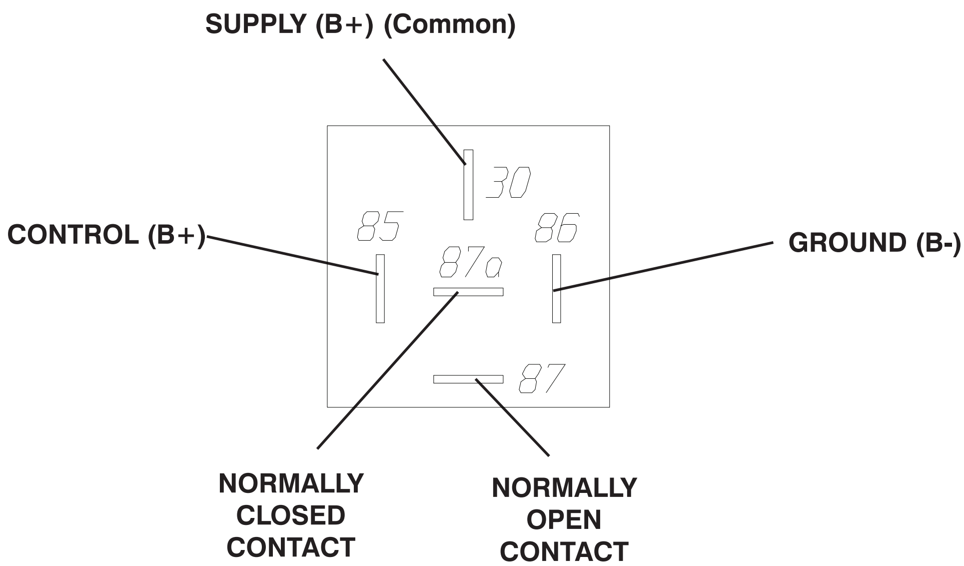
Index No.	Skyjack Part No.	Qty.	Description
2H-13B	103655	1	VALVE, Control (Lowering)
2H-13B-1	107269	1	VALVE, Control (Holding)
2H-13B-2	107269	1	VALVE, Control (Holding)
2H-18A	104132	1	VALVE, Control (Differential)
2H-59B	132749	1	VALVE, Control (Proportional)
3H-14	106273	1	VALVE, Control (Lift)
3H-17A	103623	1	VALVE, Control (Brake)
3H-18A-1	103623	1	VALVE, Control (Speed A)
3H-18A-2	103623	1	VALVE, Control (Speed B)
4H-15	153334	1	VALVE, Control (Reverse drive) (Hytos) (includes 4H-16)
	128317	1	VALVE, Control (Reverse drive) (Hytos) (includes 4H-16) (If equipped)
4H-16	-	1	VALVE, Control (Forward drive) (Hytos)
4H-23	153334	1	VALVE, Control (Right steer) (Hytos) (includes 4H-24)
	128317	1	VALVE, Control (Right steer) (Hytos) (includes 4H-24) (If equipped)
4H-24	-	1	VALVE, Control (Left steer) (Hytos)
4H-26	113953	1	VALVE, Control (Powered platform extend) (includes 4H-27) **(Models 3220/4620/4626)**
4H-27	-	1	VALVE, Control (Powered platform retract) **(Models 3220/4620/4626)**
C1	124291	1	CYLINDER (Cushion)
C2	120989	1	CYLINDER (Lift) **(Models 3220/4620)**
	120989	2	CYLINDER (Lift) **(Models 3226/4626/4632)**
C3	120236	1	CYLINDER (Steer)
C5	127100	1	CYLINDER (Powered extension platform) **(Models 3220/4620)**
	127100	2	CYLINDER (Powered extension platform) **(Model 4626)**
CB1	147889	1	VALVE, Counterbalance
CRV1	115299	1	VALVE, Cross-Over Relief (Option)
F1	109568	1	FILTER, Return
FD1	103354	1	VALVE, Flow divider/combiner
M3	134573	1	MOTOR, Hydraulic wheel (Left hand)
M4	134573	1	MOTOR, Hydraulic wheel (Right hand)
MB1	107354	1	BLOCK, Manifold (Main)
MB2	107493	1	BLOCK, Manifold (Emergency lowering)
MB3	130481	1	BLOCK, Manifold (Holding valve) **(Models 3220/4620)**
	130442	1	BLOCK, Manifold (Holding valve) **(Models 3226/4626/4632)**
MB4	108195	1	BLOCK, Manifold (Rear drive)
MB5	--	1	BLOCK, Manifold (Powered extension platform - part of cylinder weldment)
MB7	146563	1	BLOCK, Manifold (Brake release) **(Models 46xx)**
MB9	132748	1	BLOCK, Manifold (Proportional control)
O2	122213	1	ORIFICE (0.073” diameter) (Lowering) **(Model 4620)**
	105530	1	ORIFICE (0.081” diameter) (Lowering) **(Model 4632)**
O3	105811	1	ORIFICE (0.040” diameter) (Steer)

Parts list continued on the following page.

3.4 Hydraulic Schematic Parts List (Continued)

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the following page.
O4	105281	1	ORIFICE (0.067" diameter) (Emergency lowering) **(Models 3220/4620)**
	105281	2	ORIFICE (0.067" diameter) (Emergency lowering) **(Models 3226/4626/4632)**
O6	104434	1	ORIFICE (0.040" diameter) (Differential)
O7	137127	1	ORIFICE (0.020" diameter) (Brake)
P1	147661	1	PUMP, Hydraulic **(Models 3220/4620)**
	147662	1	PUMP, Hydraulic **(Models 3226/4626/4632)**
P2	146560	1	PUMP, Handle (Brake release) **(Models 46xx)**
PS1	102863	1	SWITCH, Pressure (Option)
	113799	1	• MANIFOLD BLOCK
PT1	134431	-	TRANSDUCER, Pressure (2000 psi) **(Model 3220/4626/4632)**
	134543	-	TRANSDUCER, Pressure (1250 psi) **(Model 3226)**
	134432	-	TRANSDUCER, Pressure (3000 psi) **(Model 4620)**
R1	104534	1	VALVE, Relief (System)
R2	104534	1	VALVE, Relief (Lift)
R3	106557	2	VALVE, Relief (Holding valve) **(Models 3226/4626/4632)**
V1	107271	1	VALVE (Emergency lowering)
V2	103136	1	VALVE (Free-wheeling)
V3	146562	1	VALVE (Auto reset - brake release) **(Models 46xx)**

3.5 Electrical Components Parts List



Index No.	Skyjack Part No.	Qty.	Description
17CR	108589	1	RELAY, 24 Volt (Transfer)
21ACR	108589	1	RELAY, 24 Volt (Proportional)
28CR1	108589	1	RELAY, 24 Volt (Tilt switch)
28CR2	108589	1	RELAY, 24 Volt (Down)
28ECR1	108589	1	RELAY, 24 Volt (Auxiliary tilt)
28ECR2	108589	1	RELAY, 24 Volt (Auxiliary down)
2H-13B	103605	1	COIL, 24 Volt (Lowering valve)
2H-13B-1	104493	1	COIL, 24 Volt (Holding valve)
2H-13B-2	104493	1	COIL, 24 Volt (Holding valve)
2H-18A	103613	1	COIL, 24 Volt (Differential valve)
2H-59	115370	1	COIL, 24 Volt (Proportional valve)
3H-14	105610	1	COIL, 24 Volt (Lift valve)
3H-17A	103605	1	COIL, 24 Volt (Brake valve)
3H-18A-1	103613	1	COIL, 24 Volt (Speed A)
3H-18A-2	103613	1	COIL, 24 Volt (Speed B)
4H-15	153334	1	COIL, 24 Volt (Reverse drive spool valve) (Hytos)
	128320	1	COIL, 24 Volt (Reverse drive spool valve) (Hytos) (If equipped)
4H-16	153334	1	COIL, 24 Volt (Forward drive spool valve) (Hytos)
	128320	1	COIL, 24 Volt (Forward drive spool valve) (Hytos) (If equipped)
4H-23	153334	1	COIL, 24 Volt (Right steer spool valve) (Hytos)
	128320	1	COIL, 24 Volt (Right steer spool valve) (Hytos) (If equipped)
4H-24	153334	1	COIL, 24 Volt (Left steer spool valve) (Hytos)
	128320	1	COIL, 24 Volt (Left steer spool valve) (Hytos) (If equipped)
4H-26	103605	1	COIL, 24 Volt (Power extension platform extend) (option)
4H-27	103605	1	COIL, 24 Volt (Power extension platform retract) (option)

Parts list continued on the following page.

3.5 Electrical Component Parts List

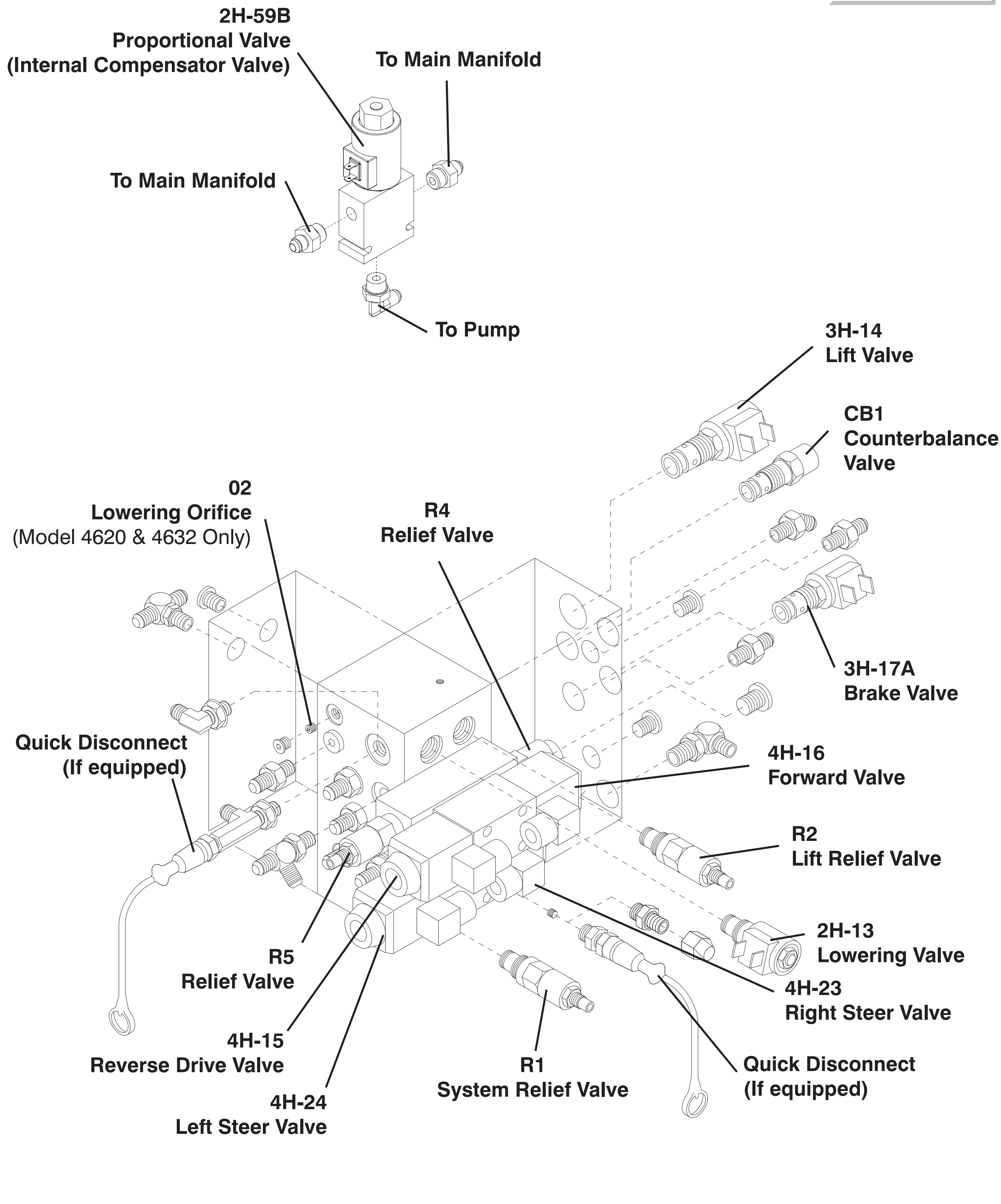
Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the previous page.
AT1	130440	1	TRANSDUCER, Angle
B1-B4	103480	4	BATTERY, 6 Volt (U2200)
B1-B4	106552	4	BATTERY, 6 Volt (U2500)
B1-B4	$	4	BATTERY, 6 Volt (T2200)
BC	152070	1	CHARGER, Battery (24VDC)
BCI	122093	1	BATTERY CHARGE INDICATOR
BP-29	117967	1	BEEPER, 9-28 VDC
C1	146475	1	CONTACTOR
CB1	149780	1	CIRCUIT BREAKER (10 Amp)
CB2	149780	1	CIRCUIT BREAKER (10 Amp)
CM1	130439	1	CONTROL MODULE, Integrated sensor
D02-X	129258	AR	DIODE
D19A	-		ALARM OPTION
DA1	119758	1	DIODE PACK
DA2	119520	1	DIODE ASSEMBLY
DA3	119624	1	DIODE ASSEMBLY
DXX	102921	AR	DIODE
F1	310517	1	FUSE (300 Amp) (In-line fuse)
FL-22	121477	1	FLASHING LIGHT, 24VDC (option)
H1	146649	1	HORN, Operator (Low tone)
LED-1	147061	1	POWER INDICATOR LIGHT (Platform control console)
LED-2	147061	1	POWER INDICATOR LIGHT (Base control console)
LS1A	121975	1	LIMIT SWITCH (High speed)
LS1B	121975	1	LIMIT SWITCH (High speed)
LS4	125887	1	LIMIT SWITCH, Pothole protection (Battery tray)
LS5	125885	1	LIMIT SWITCH, Pothole protection (Hydraulic tray)
LS6	121975	1	LIMIT SWITCH (Drive override)
PT1	134431	1	TRANSDUCER, Pressure (2000 psi) **(Model 3220/4626/4632)**
	134432	1	TRANSDUCER, Pressure (3000 psi) **(Model 4620)**
	134543	1	TRANSDUCER, Pressure (1250 psi) **(Model 3226)**
RST1	119629	1	RESISTOR (2.7K ohm)
RST2	146644	1	RESISTOR (25W-30 ohm)
RST3	116505	1	RESISTOR, Low voltage protection
S1	119725	1	SWITCH, Main power disconnect
S2	147054	2	N.O. CONTACT (Raise/Lower)
S3	116382	1	SWITCH, Toggle (4NT1-1)
	147053	3	N.C. CONTACT (Lift/Drive) (If equipped)
	147054	3	N.O. CONTACT (Lift/Drive) (without power extension platform) (If equipped)
		4	N.O. CONTACT (Lift/Drive) (with power extension platform) (If equipped)
S4	147053	2	N.C. CONTACT (Emergency stop) (Platform control console)
S7	123994	1	PROPORTIONAL CONTROLLER ASSEMBLY
			Parts list continued on the following page.

3.5 Electrical Component Parts List (Continued)

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the previous page.
S7-1	122869	1	SWITCH, Neutral
S7-2	122877	1	SWITCH, Right steer
S7-3	122877	1	SWITCH, Left steer
S7-6	122872	1	SWITCH, Enable pushbutton
S8	147054	1	N.O. CONTACT (Horn)
S10	147053	2	N.C. CONTACT (Off/Platform)
	147054	1	N.O. CONTACT (Base)
S11	102853	1	SWITCH (Extend/Retract) (Powered extension platform)
S12	102853	1	SWITCH (Enable) (Powered extension platform)
S27	115574	1	SWITCH, Toggle (1NT1-2)
S28	147053	1	N.C. CONTACT (Emergency stop) (Base control console)
TT	103336	1	HOURMETER

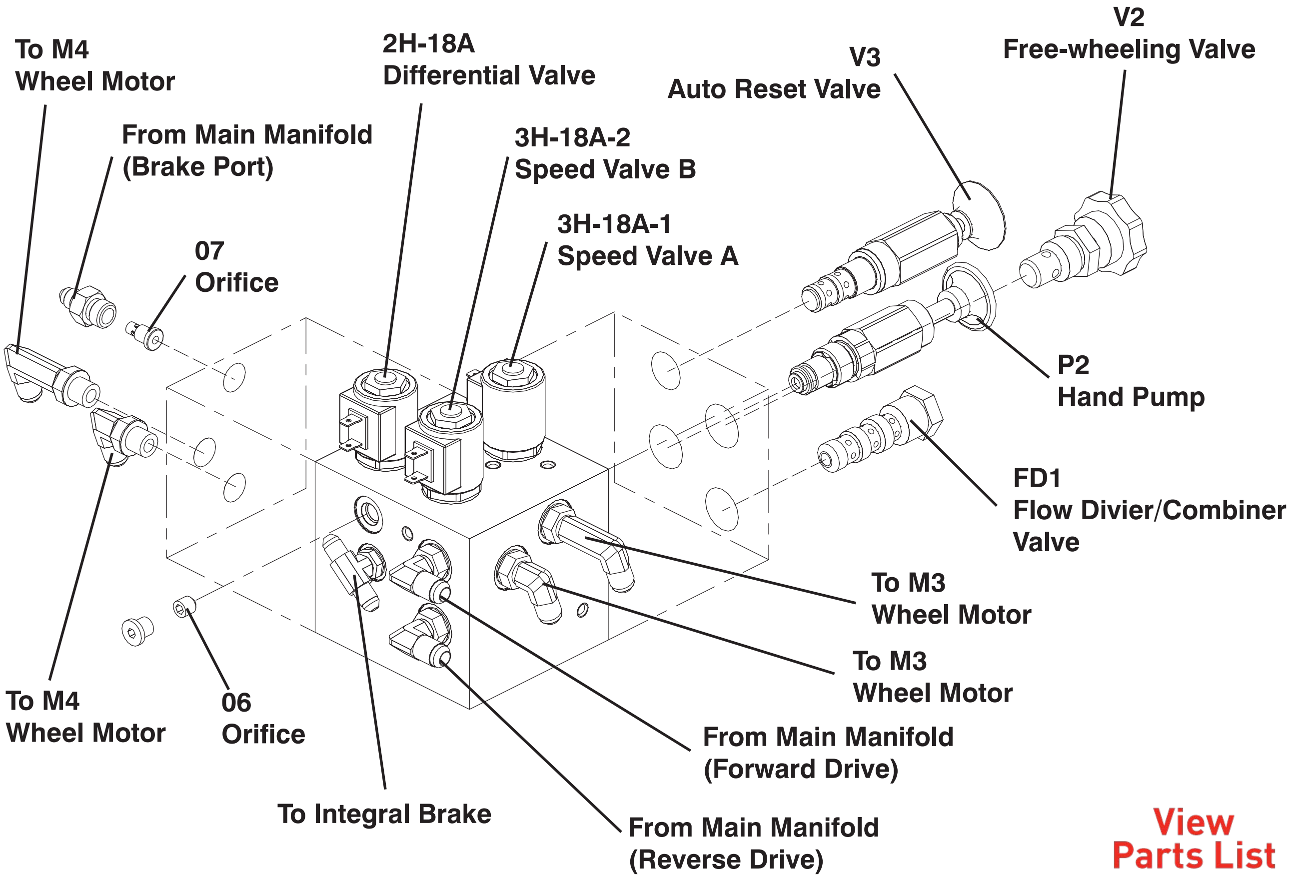
3.6 Hydraulic Manifold and Port Identifications

View Parts List



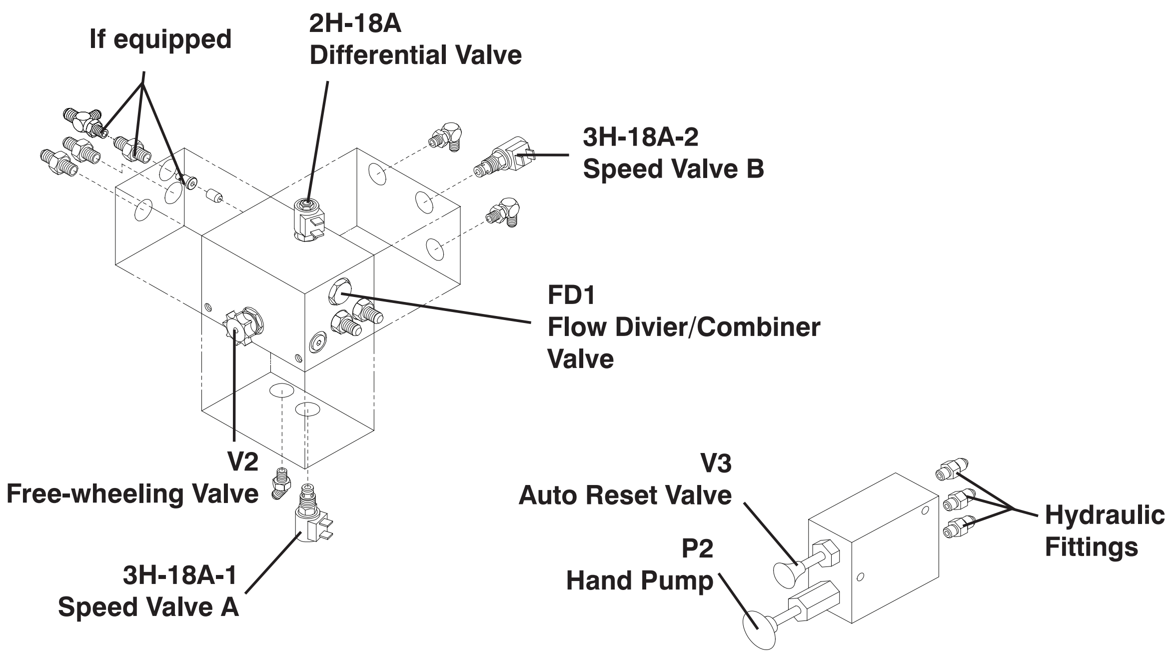
3.6 Hydraulic Manifold and Port Identifications (Continued)

Model 322x



View
Parts List

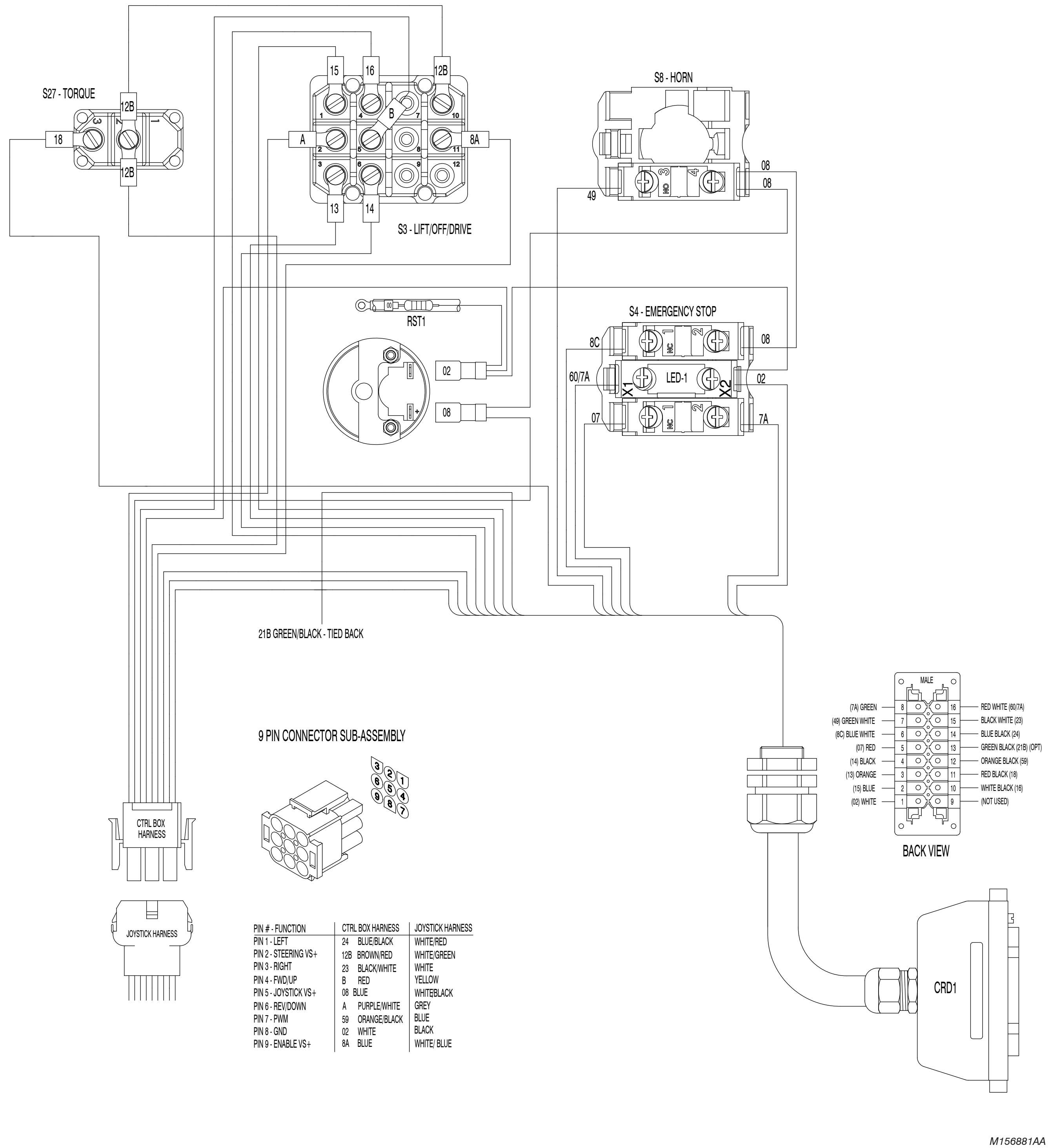
Model 46xx



3.7a Platform Control Console Diagram

Serial Breakdown Reference Chart	
Model	**Serial Number**
SJ3 3220	60002138 & above
SJ3 3226	27006059 & above
SJ3 46XX	70006694 & above

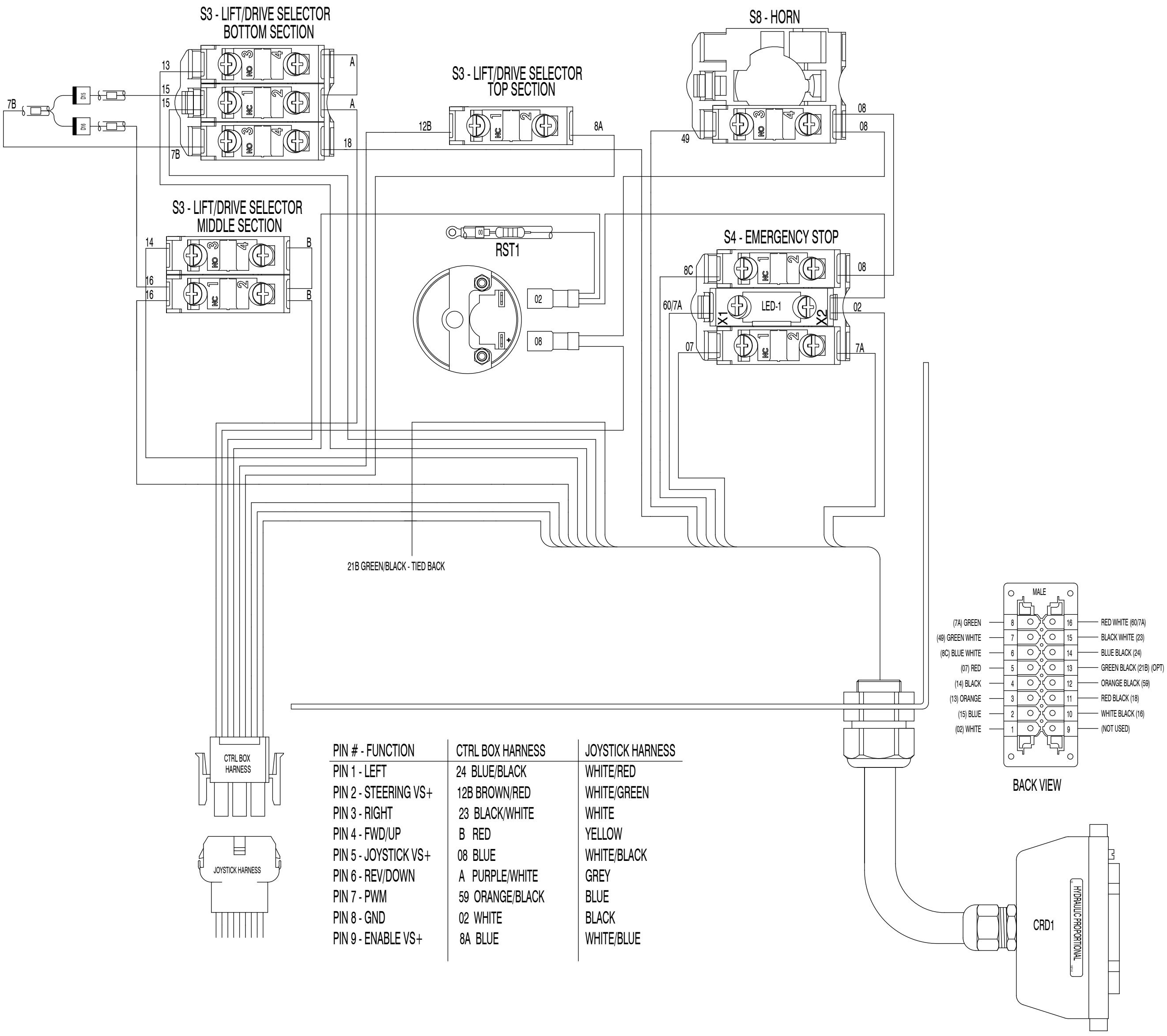
View Parts List



3.7b Platform Control Console Diagram

Serial Breakdown Reference Chart	
Model	**Serial Number**
SJ3 3220	60002137 & below
SJ3 3226	27006058 & below
SJ3 46XX	70006693 & below

View Parts List



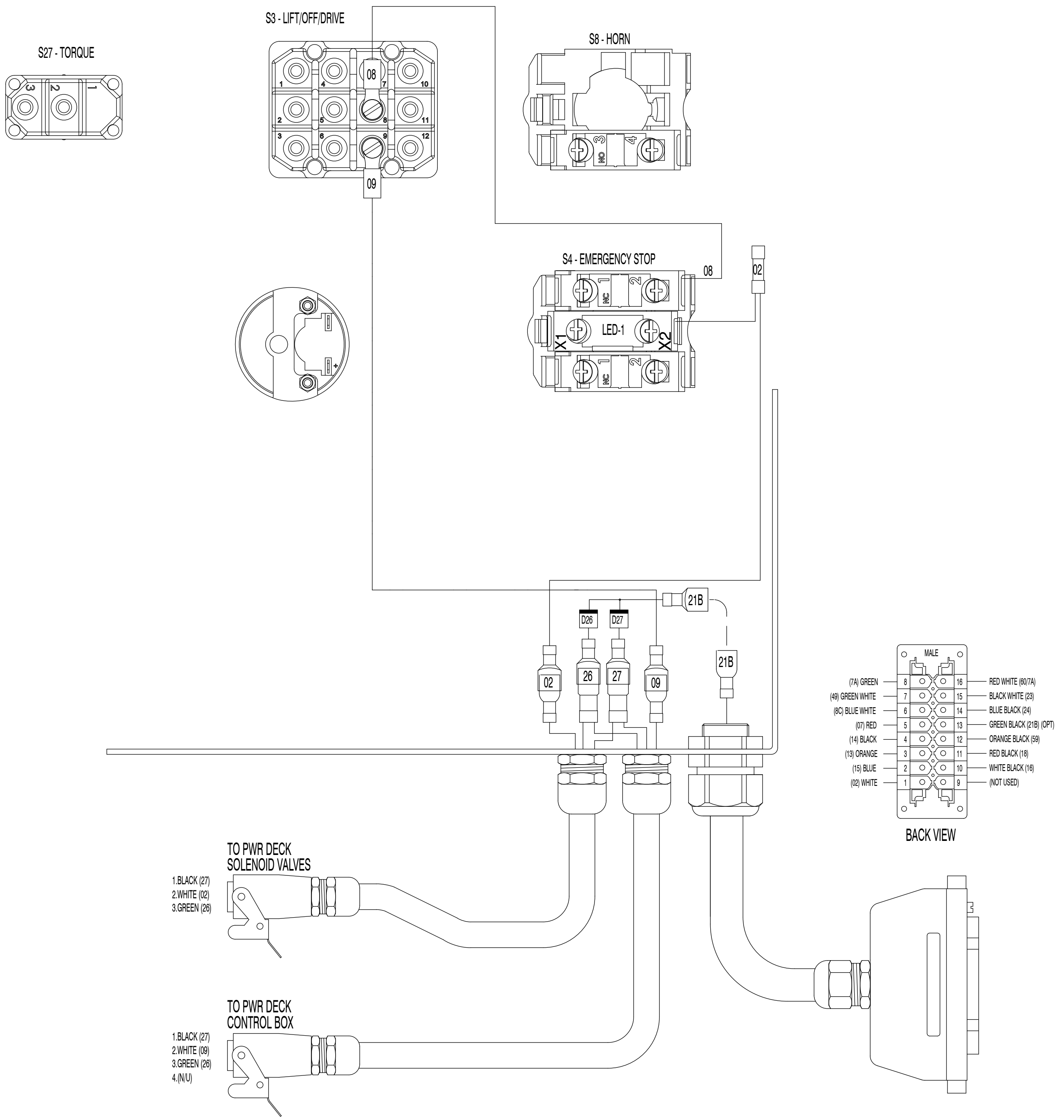
PIN # - FUNCTION	CTRL BOX HARNESS	JOYSTICK HARNESS
PIN 1 - LEFT	24 BLUE/BLACK	WHITE/RED
PIN 2 - STEERING VS+	12B BROWN/RED	WHITE/GREEN
PIN 3 - RIGHT	23 BLACK/WHITE	WHITE
PIN 4 - FWD/UP	B RED	YELLOW
PIN 5 - JOYSTICK VS+	08 BLUE	WHITE/BLACK
PIN 6 - REV/DOWN	A PURPLE/WHITE	GREY
PIN 7 - PWM	59 ORANGE/BLACK	BLUE
PIN 8 - GND	02 WHITE	BLACK
PIN 9 - ENABLE VS+	8A BLUE	WHITE/BLUE

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3.8a Platform Control Console with Toggle Switch - Powered Extension Platform Modification Diagram

Serial Breakdown Reference Chart	
Model	**Serial Number**
SJ3 3220	60002138 & above
SJ3 3226	27006059 & above
SJ3 46XX	70006694 & above

View Parts List

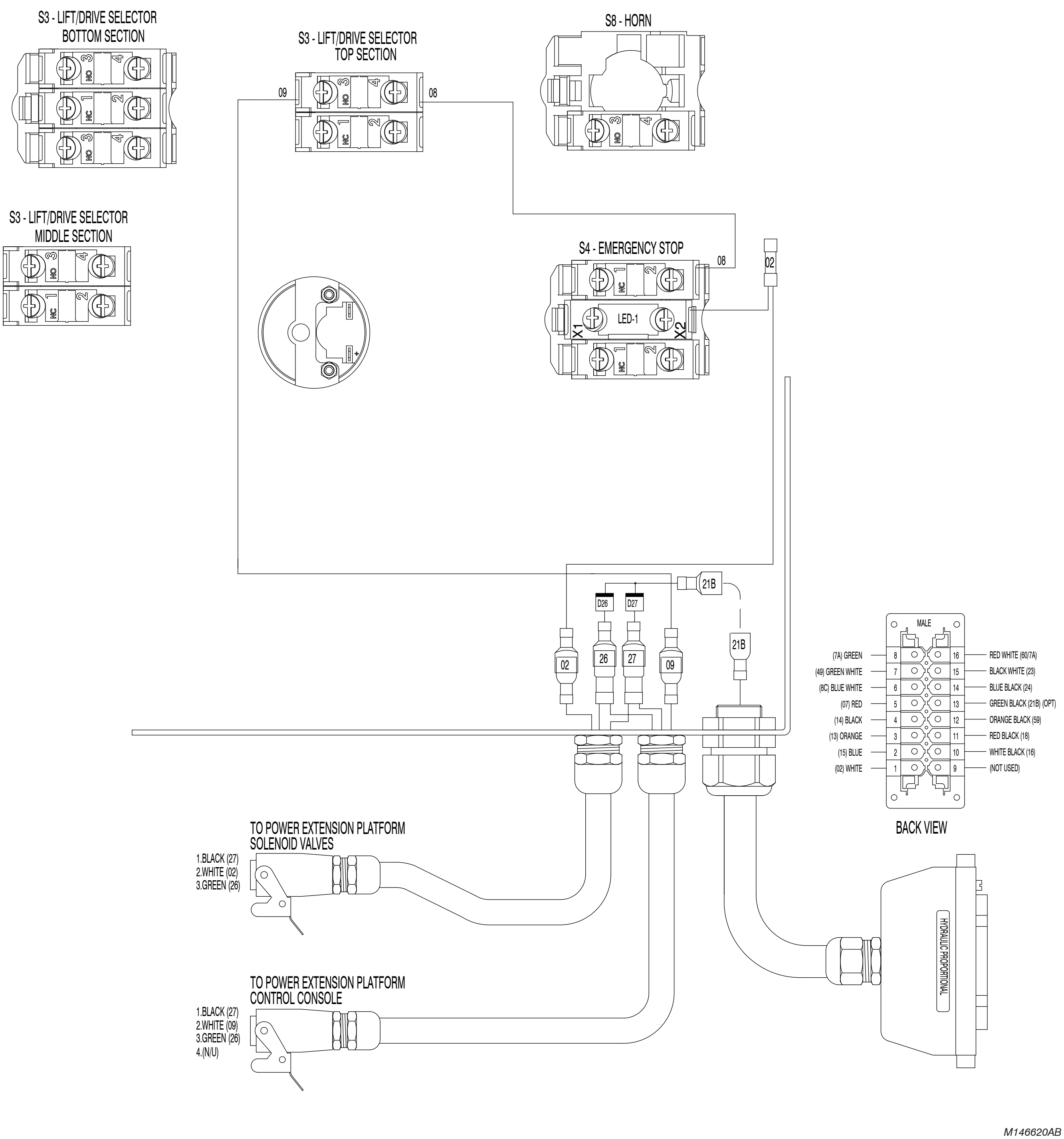


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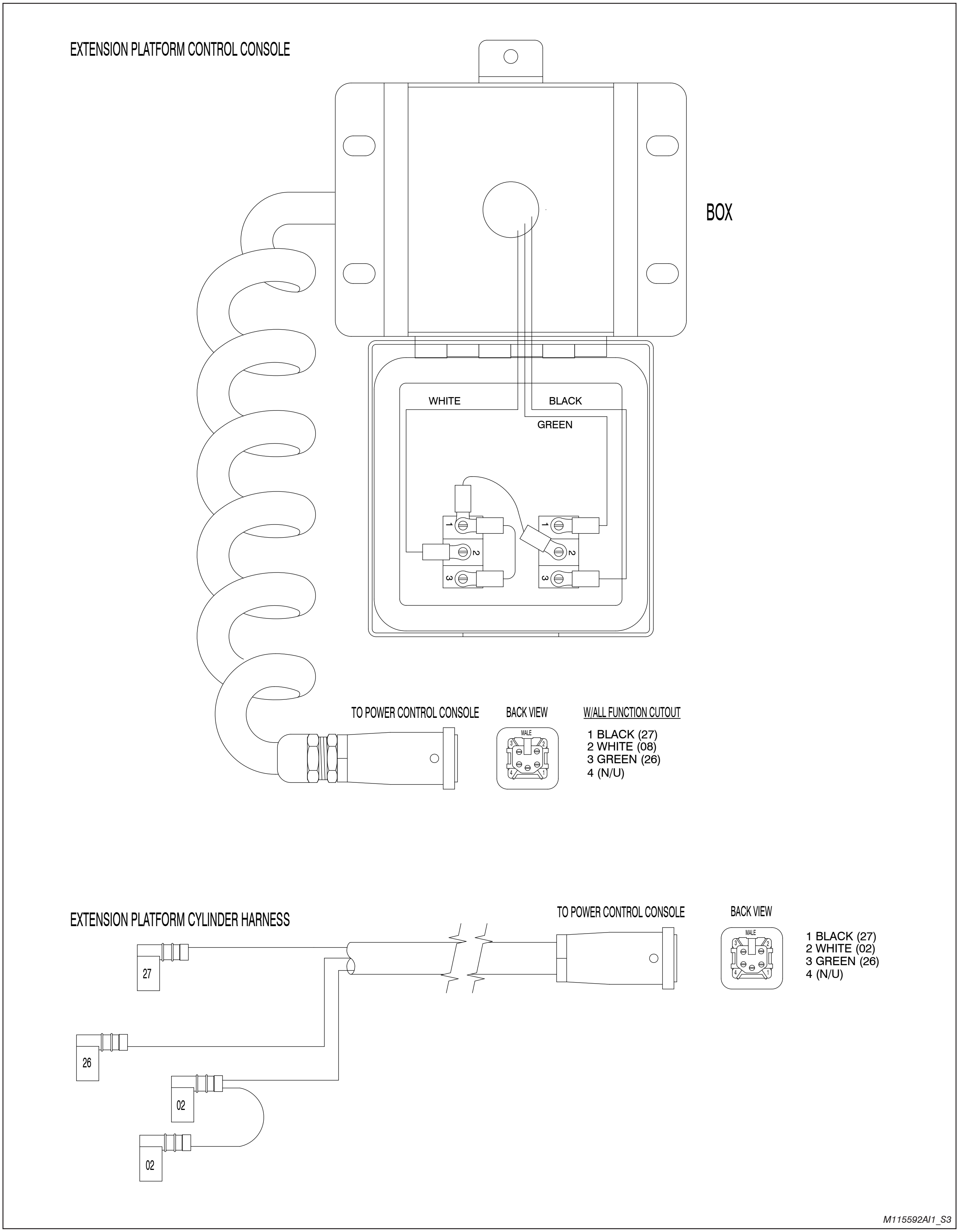
3.8b Platform Control Console with Rotary Switch - Powered Extension Platform Modification Diagram

Serial Breakdown Reference Chart	
Model	**Serial Number**
SJ3 3220	60002137 & below
SJ3 3226	27006058 & below
SJ3 46XX	70006693 & below

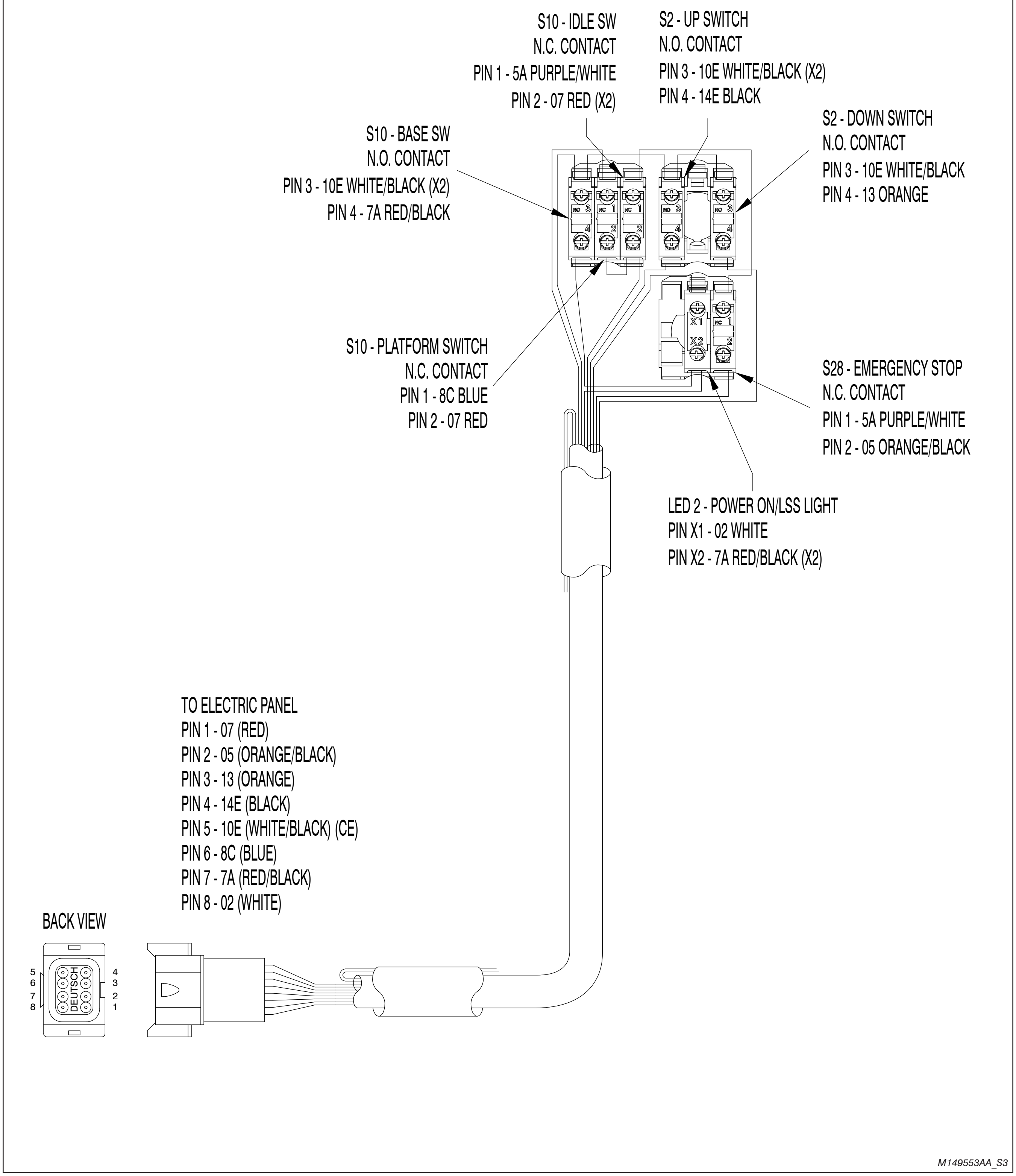
View Parts List



3.9 Powered Extension Platform Control Console and Harness



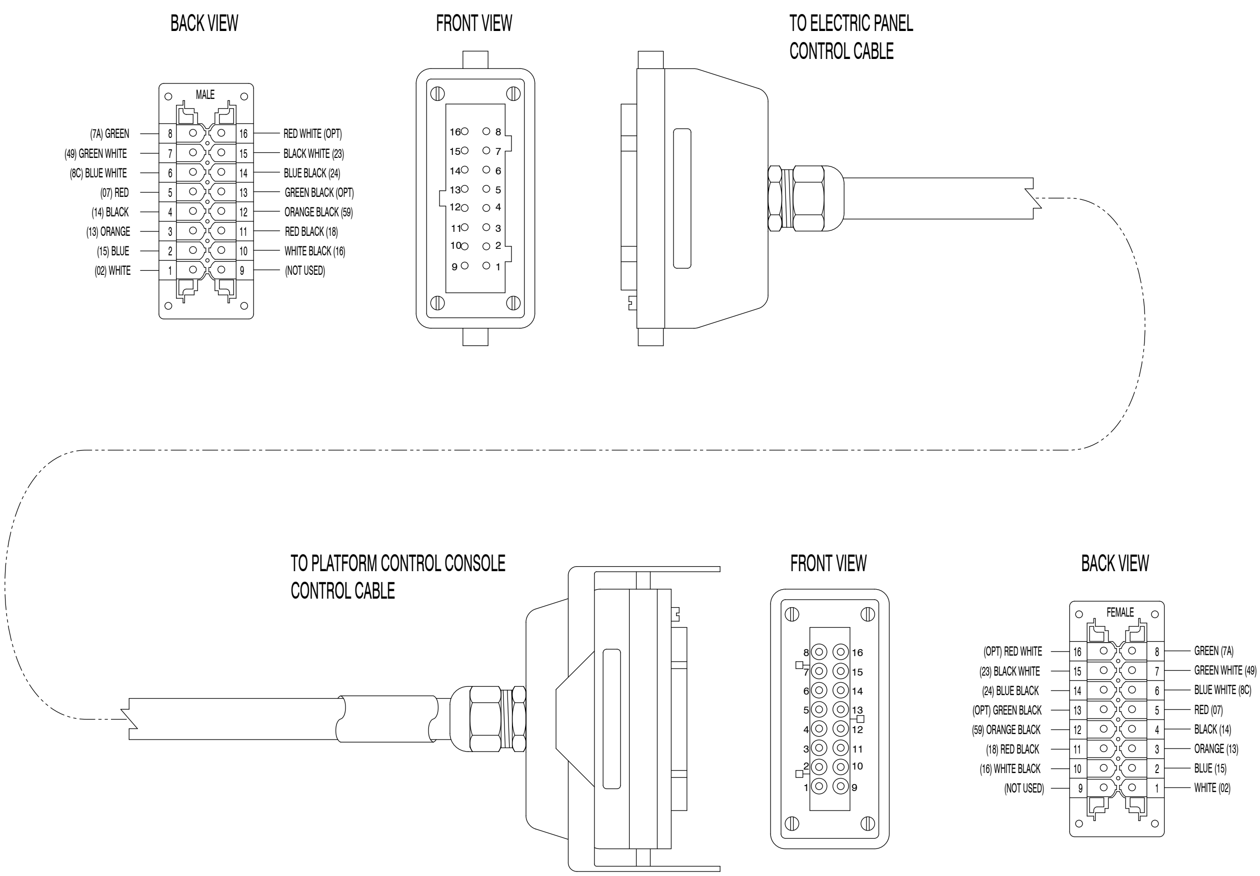
3.10 Base Control Console Diagram



3.11 Scissor Arm Control Cable Diagram

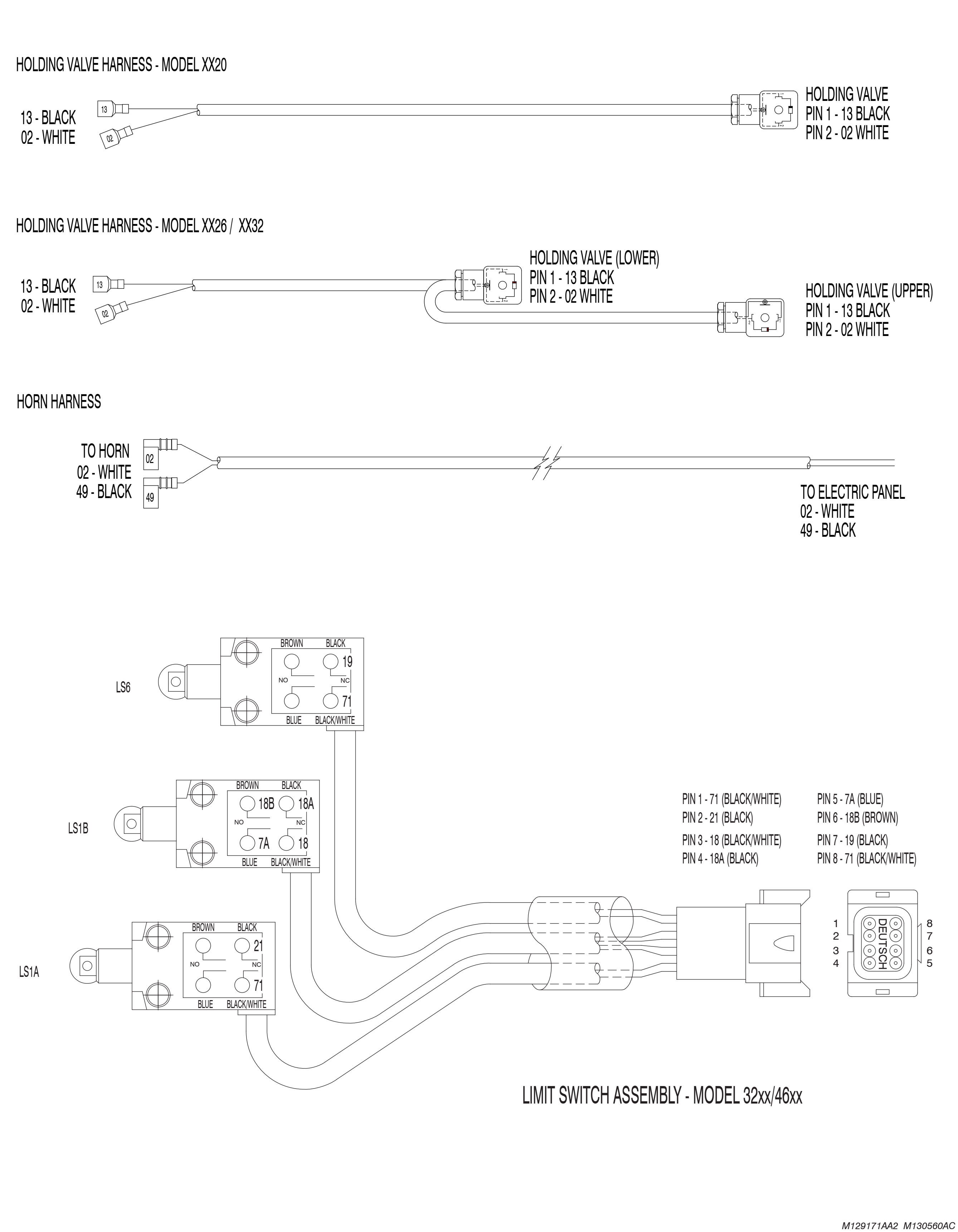
CONTROL CABLE OPTIONS

WIRE COLOUR	EUROPE WIRE NUMBER	N.A WIRE NUMBER
GREEN/BLACK	21B	21B
RED/WHITE	60	7A

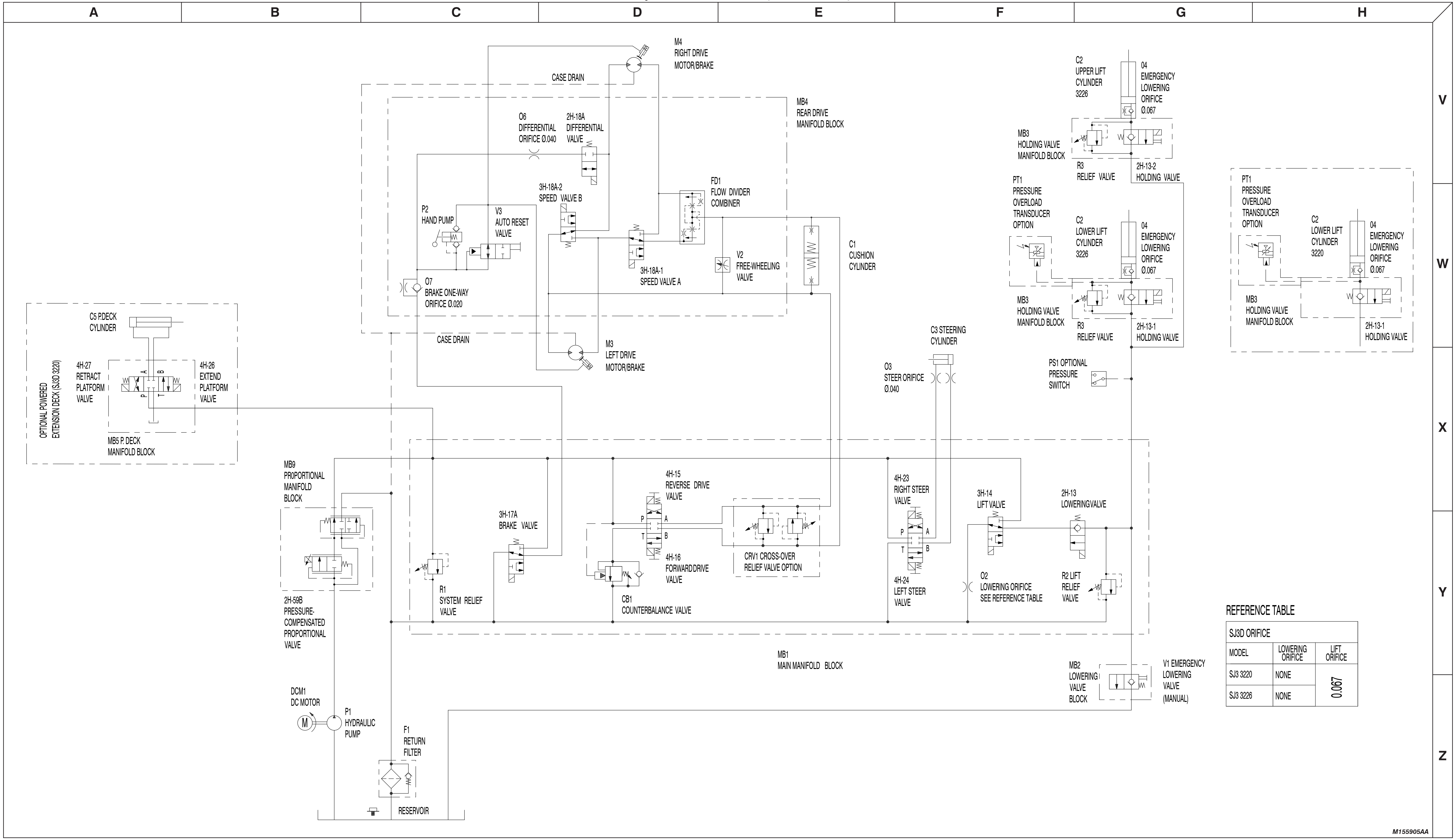


M146650AB_S3

3.12 Holding Valve & Horn Harnesses, and Limit Switch Diagrams



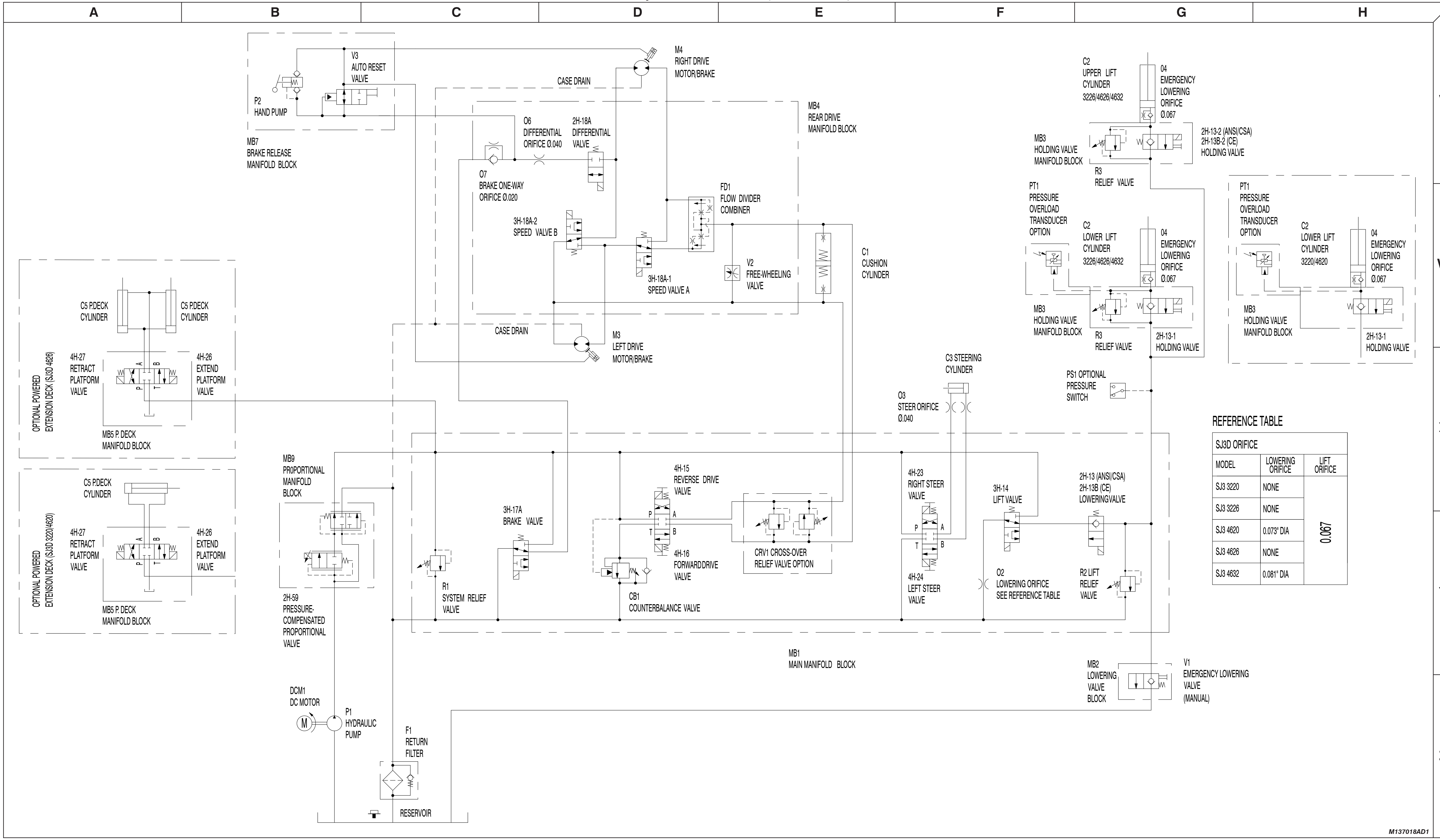
3.13 Hydraulic Schematic (Models 322x)



REFERENCE TABLE

SJ3D ORIFICE		
MODEL	LOWERING ORIFICE	LIFT ORIFICE
SJ3 3220	NONE	0.067
SJ3 3226	NONE	

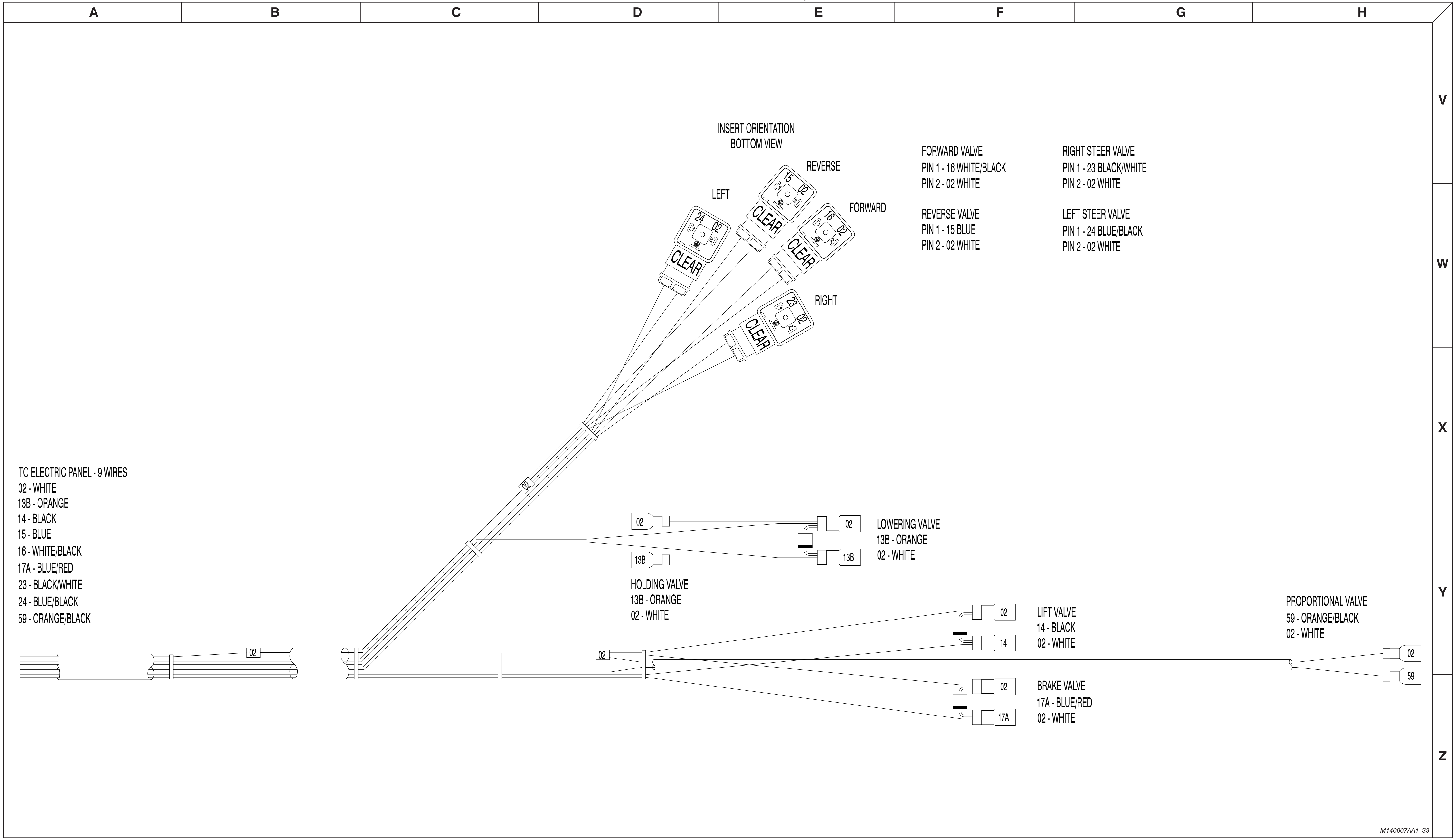
3.14 Hydraulic Schematic (Models 46xx)



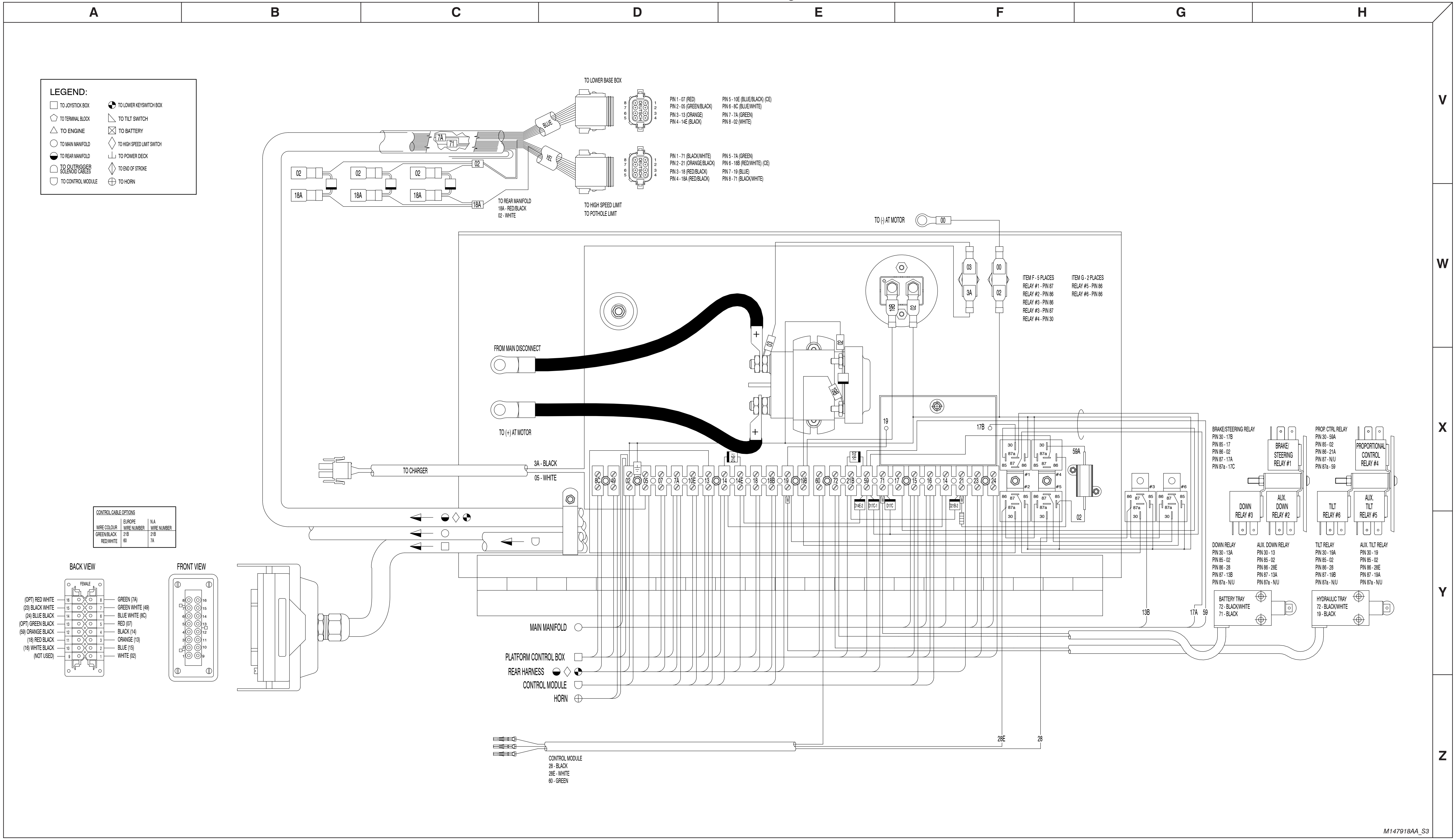
REFERENCE TABLE

SJ3D ORIFICE		
MODEL	LOWERING ORIFICE	LIFT ORIFICE
SJ3 3220	NONE	0.067
SJ3 3226	NONE	
SJ3 4620	0.073" DIA	
SJ3 4626	NONE	
SJ3 4632	0.081" DIA	

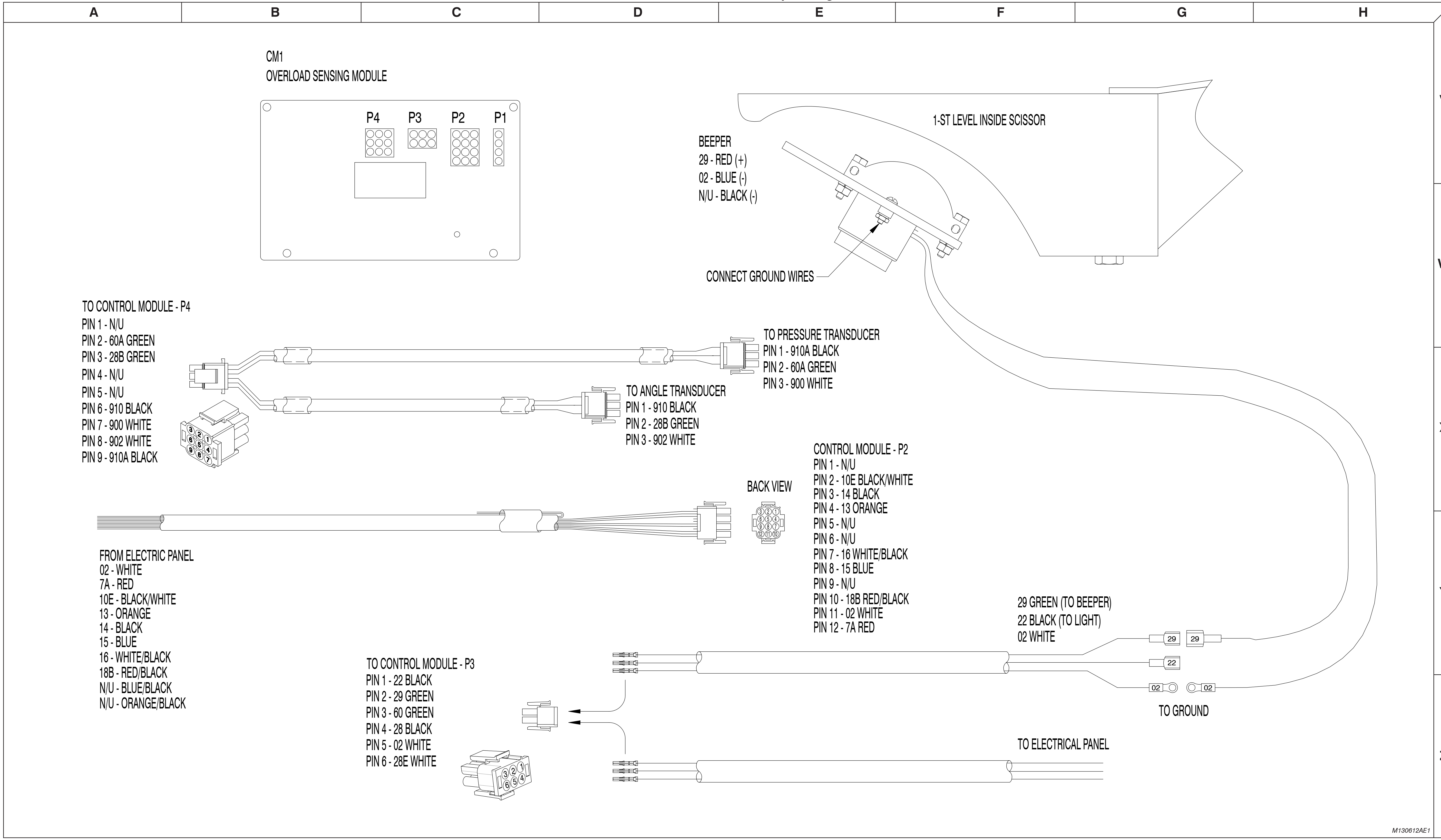
3.15 Main Manifold Harness and Holding Valve Harness



3.16 Electrical Panel Diagram



3.17 Control Module and Beeper Diagram

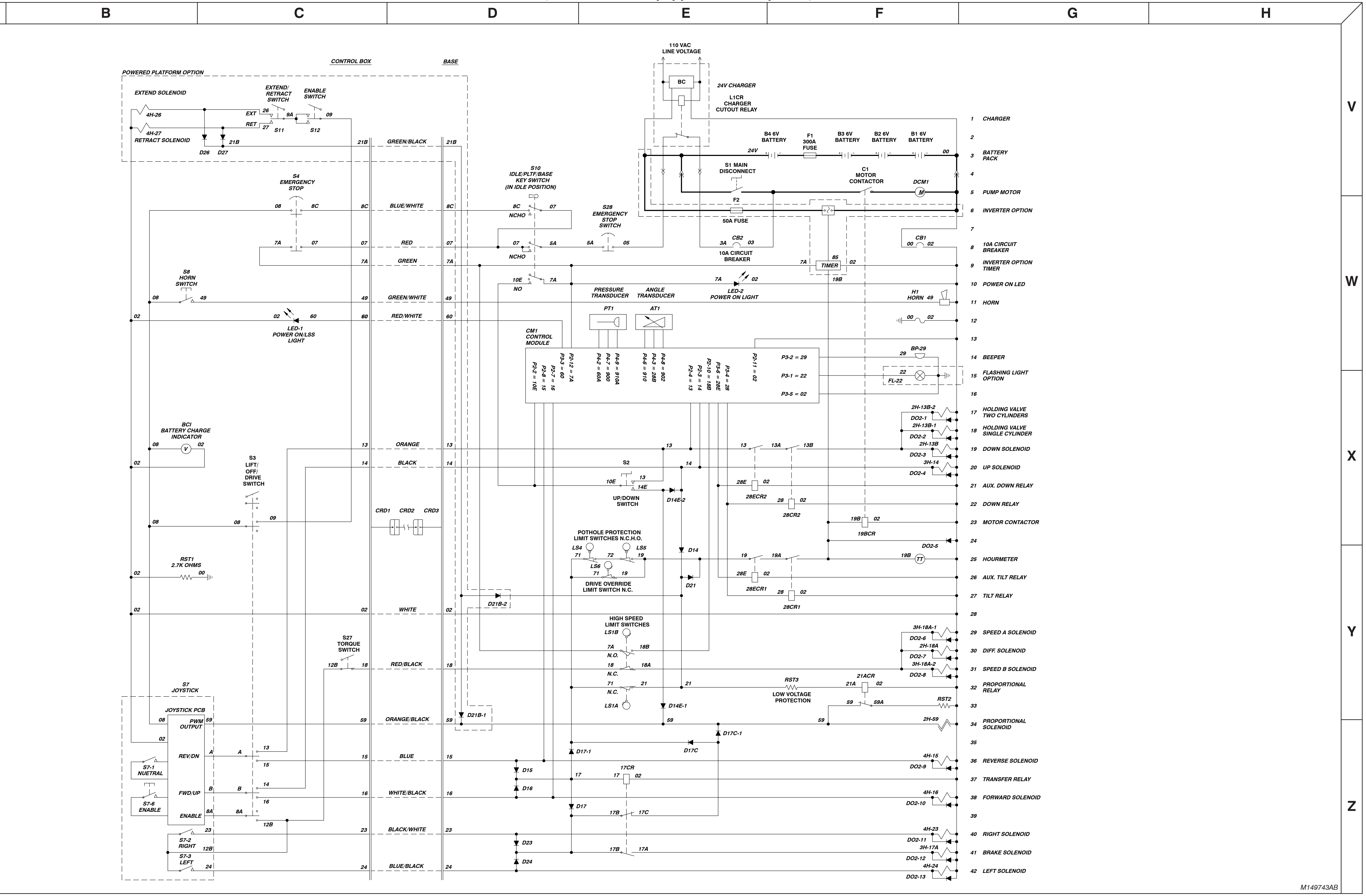


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3.18a Electrical Schematic (Models 322x - Equipped with all options)

AB

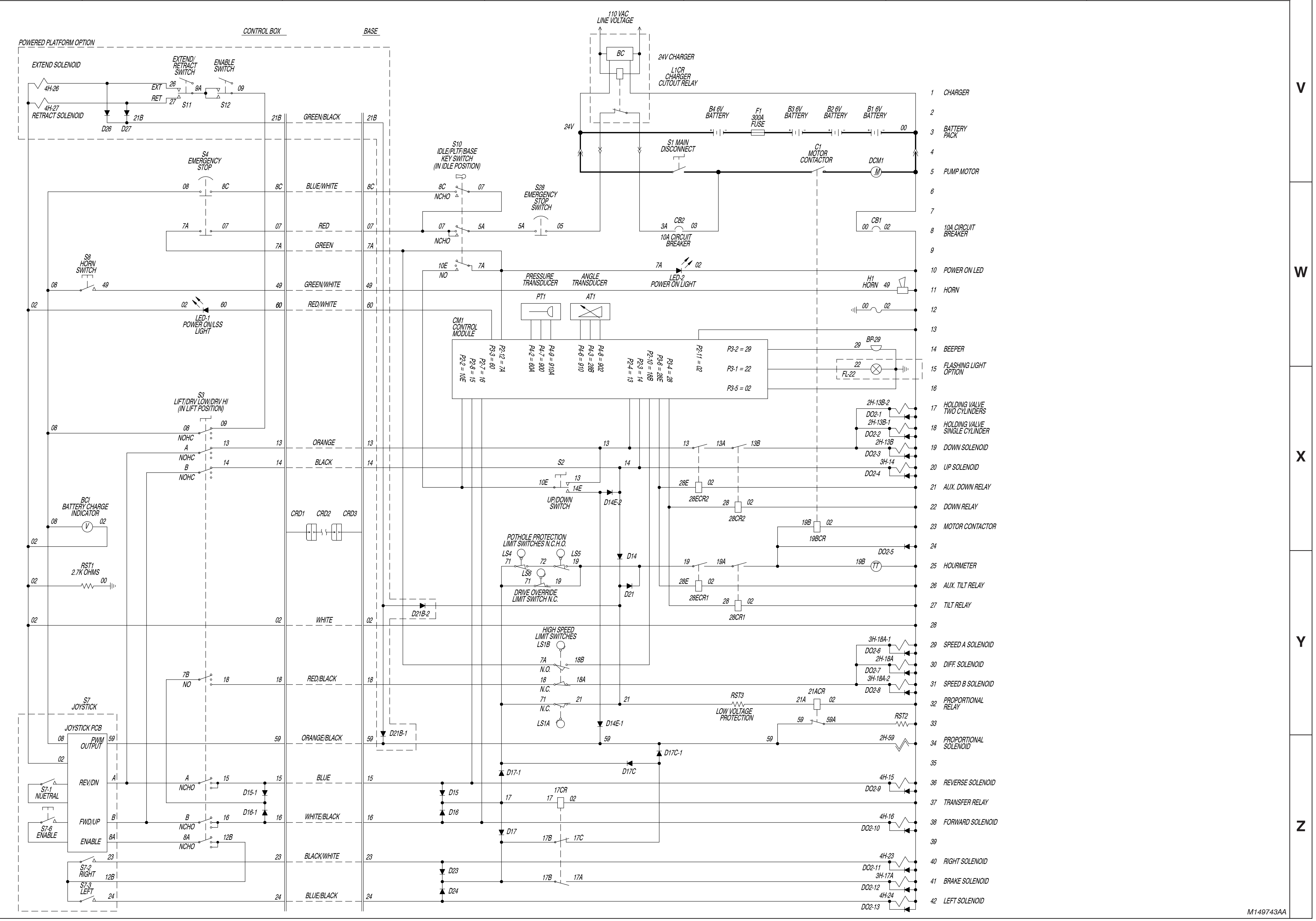
Serial Breakdown Reference Chart	
Model	**Serial Number**
SJ3 3220	60002138 & above
SJ3 3226	27006059 & above



3.18b Electrical Schematic (Models 322x - Equipped with all options)

AB

Serial Breakdown Reference Chart	
Model	**Serial Number**
SJ3 3220	60002137 & below
SJ3 3226	27006058 & below



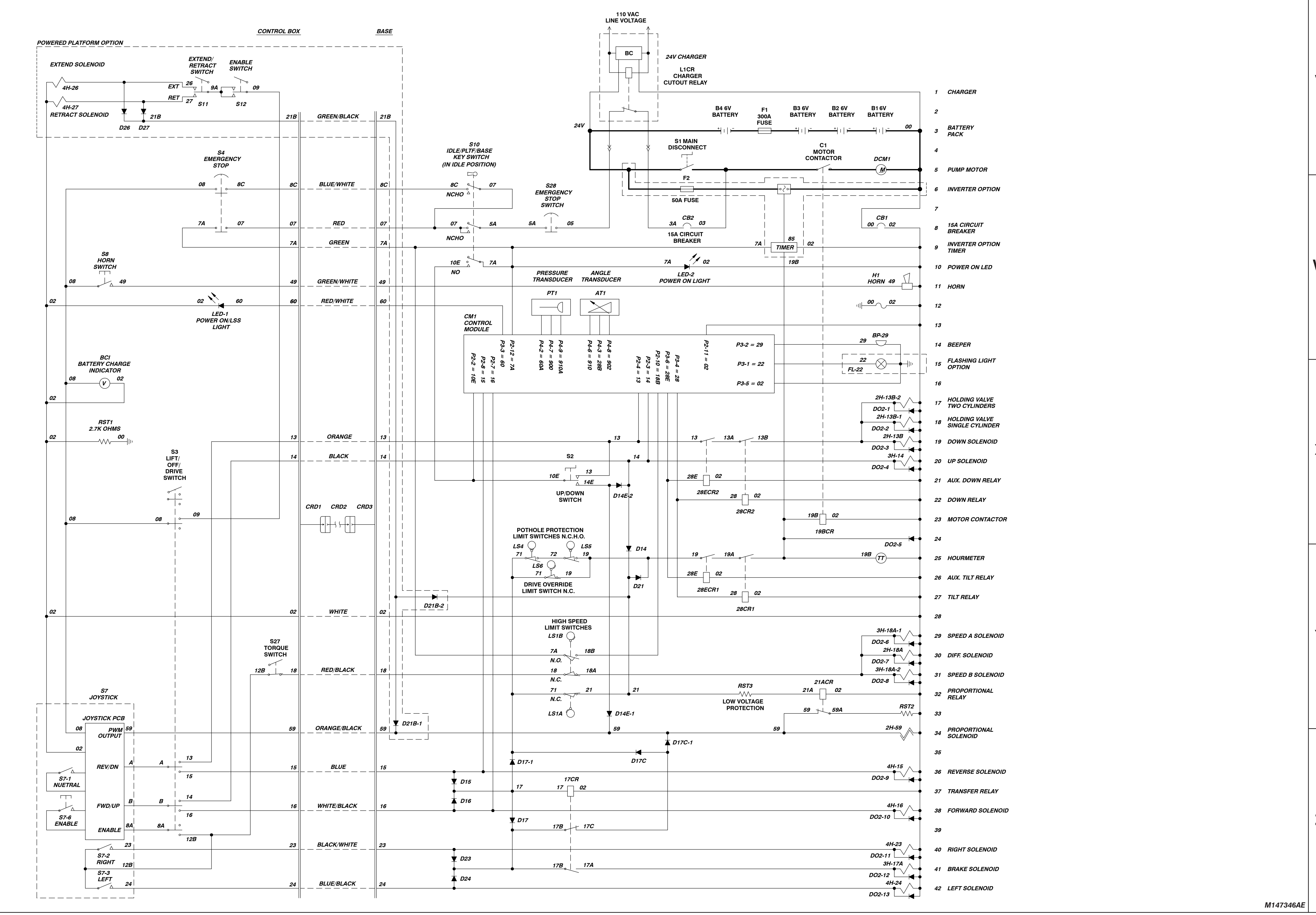
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View Parts List

3.19a Electrical Schematic (Models 46xx - Equipped with all options)

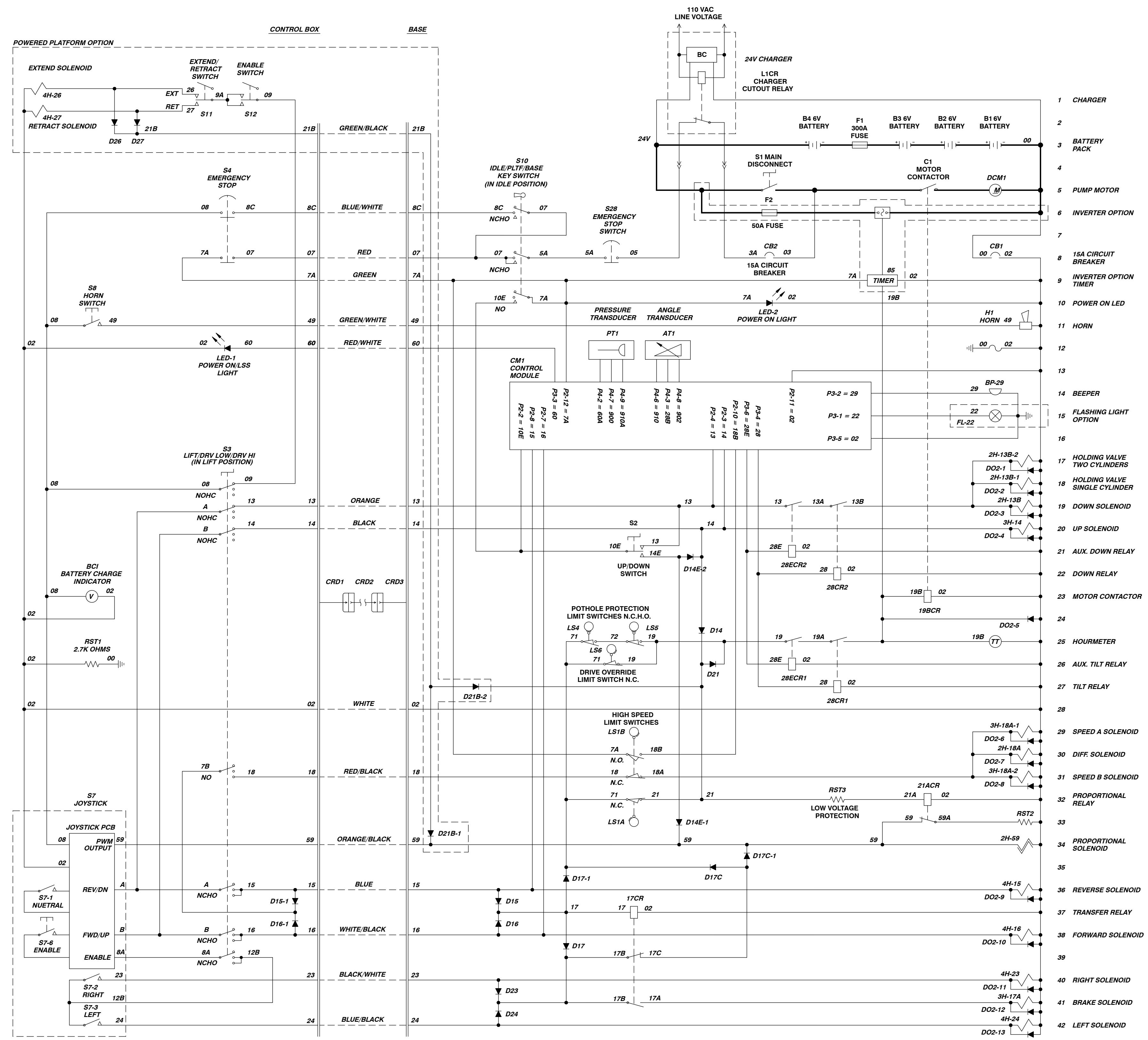
AB

Serial Breakdown Reference Chart	
Model	Serial Number
SJ3 46XX	70006694 & above



3.19b Electrical Schematic (Models 46xx - Equipped with all options)

Serial Breakdown Reference Chart	
Model	**Serial Number**
SJ3 46XX	70006693 & below



Notes

Section 4
TROUBLESHOOTING INFORMATION

Table of Contents

4

Notes

Introduction

The following pages contain a table of Troubleshooting Information for locating and correcting most service trouble which can develop. Careful and accurate analysis of the systems listed in the table of Troubleshooting Information will localize the trouble more quickly than any other method. This manual cannot cover all possible troubles and deficiencies that may occur. If a specific trouble is not listed, isolate the major component in which the trouble occurs, isolate whether the problem is electrical or hydraulic, and then isolate and correct the specific problem.

The content of this section is separated into "probable cause" and "remedy." The information preceded by a number represents the "probable cause." The following line, noted by a dash represents the "remedy" to the "probable cause" directly above it. See example below for clarification.

1. Probable Cause
    - Remedy

Electrical System

4.1-1 All Controls Inoperative

1. Battery charger plugged into external power source.
    - Disconnect charger cord.
2. Batteries disconnected.
    - Connect batteries.
3. Dirty or loose battery terminals.
    - Clean and tighten connections.
4. Battery charge low.
    - Check each cell with a hydrometer. Reading should be 1.275 (fully charged). Recharge if low reading. Replace if reading difference between cells is 0.050.
5. Main battery cables open or defective.
    - Check continuity. Replace if defective.
6. Fuse F1 defective.
    - Replace fuse.
7. Main battery disconnect switch S1 open or defective.
    - Close switch. Check continuity. Replace if defective.
8. Loose or broken wire #3 from motor contactor C1 to circuit breaker CB2.
    - Check continuity. Replace if defective.
9. Defective or tripped circuit breaker CB2.
    - Reset circuit breaker. Replace if defective.
10. Loose or broken wire #3A from circuit breaker CB2 to charger relay L1CR.
    - Check continuity. Replace if defective.
11. Defective battery charger relay L1CR.
    - Check relay. Replace if defective.
12. Loose or broken wire #5 from charger relay L1CR to base emergency stop switch S28.
    - Check continuity. Replace if defective.
13. Open or defective base emergency stop switch S28.
    - Close switch. Check switch. Replace if defective.
14. Loose or broken wire #5A from base emergency stop switch S28 to base key switch S10.
    - Check continuity. Replace if defective.
15. Open or defective base key switch S10.
    - Select function with switch. Check switch. Replace if defective.
16. Loose or broken wire #07 from base key switch S10 to base terminal block.
    - Check continuity. Replace if defective.
17. Loose or broken wire #07 from base terminal block to platform emergency stop switch S4.
    - Check continuity. Replace if defective.
18. Open or defective platform emergency stop switch S4.
    - Close switch. Replace if defective.
19. Loose or broken wire #7A from platform emergency stop switch S4 to base terminal block.
    - Check continuity. Replace if defective.
20. Loose or broken wire #7A from base terminal block to base key switch S10.
    - Check continuity. Replace if defective.
21. Open or defective base key switch S10.
    - Close switch. Replace if defective.

21\. Loose or broken wire #00 from pump motor DCM1 to circuit breaker CB1.
    - Check continuity. Replace if defective.

22\. Defective or tripped circuit breaker CB1.
    - Reset circuit breaker. Replace if defective.

23\. Loose or broken wire #02 from circuit breaker CB1 to base terminal block.
    - Check continuity. Replace if defective.

Electrical System (Continued)

24. Loose or broken wire #7A from base terminal block to CM1 control module pin P2-12.
    - Check continuity. Replace if defective.
25. Loose or broken wire #02 from base terminal block to CM1 control module pin P2-11.
    - Check continuity. Replace if defective.
26. Loose or broken wire #28 from CM1 control module pin P3-4 to tilt relay 28CR1 and down relay 28CR2.
    - Check continuity. Replace if defective.
27. Loose or broken wire #28E from CM1 control module pin P3-6 to Aux. tilt relay 28ECR1 and Aux. down relay 28ECR2.
    - Check continuity. Replace if defective.

4.1-2 All Controls Inoperative From Base Control Console

1. Loose or broken wire #10E from base key switch S10 to base up/down switch S2.
    - Check continuity. Replace if defective.
2. Loose or broken wire #10E from base terminal block to CM1 control module pin P2-2.
    - Check continuity. Replace if defective.

4.1-3 All Controls Inoperative From Platform Control Console

1. Loose or broken wire #8C from base key switch S10 to base terminal block.
    - Check continuity. Replace if defective.
2. Loose or broken wire #8C or wire #02 from base terminal block to platform emergency stop switch S4.
    - Check continuity. Replace if defective.
3. Open or defective platform emergency stop switch S4.
    - Close switch. Replace if defective.
4. Loose or broken wire #8 or wire #02 from emergency stop switch S4 to battery charge indicator BCI.
    - Check continuity. Replace if defective.
5. Loose or broken wire #8 or wire #02 from battery charge indicator BC1 to joystick S7.
    - Check continuity. Replace if defective.
6. Defective joystick enable switch S7-6.
    - Check switch. Replace if defective.
7. Defective joystick neutral switch S7-1.
    - Check switch. Replace if defective.
8. Defective joystick S7.
    - Check joystick. Replace if defective.

4.1-4 No Drive or Up Function from Platform Controls

1. Defective tilt relay 28CR1 or Aux. tilt relay 28ECR1.
    - Check relay. Replace if defective.
2. Loose or broken wire #02 from base terminal block to tilt relay 28CR1 or Aux. tilt relay 28ECR1.
    - Check continuity. Replace if defective.
3. Loose or broken wire #28 from CM1 control module pin P3-4 to tilt relay 28CR1.
    - Check continuity. Replace if defective.
4. Loose or broken wire #28E from CM1 control module pin P3-6 to Aux. tilt relay 28ECR1.
    - Check continuity. Replace if defective.
5. Loose or broken wire #19 from base terminal block to Aux. tilt relay 28ECR1.
    - Check continuity. Replace if defective.
6. Loose or broken wire #19A from Aux. tilt relay 28ECR1 to tilt relay 28CR1.
    - Check continuity. Replace if defective.

Electrical System (Continued)

7. Loose or broken wire #19B from tilt relay 28CR1 to hour meter.
   - Check continuity. Replace if defective.
8. Loose or broken wire #19B from hour meter to motor contactor C1.
   - Check continuity. Replace if defective.
9. Loose or broken wire #59 from proportional controller S7 to base terminal block.
   - Check continuity. Replace if defective.
10. Loose or broken wire #59 from base terminal block to proportional coil 2H-59.
    - Check continuity. Replace if defective.
11. Loose or broken wire #02 from base terminal block to proportional coil 2H-59.
    - Check continuity. Replace if defective.
12. Defective proportional coil 2H-59.
    - Check continuity through coil. Replace if defective.

4.1-5 No Down or Reverse Function from Platform Controls

1. Loose or broken wire “A” from proportional controller S7 to lift/drive switch S3.
   - Check continuity. Replace if defective.
2. Lift/Drive switch S3 defective.
   - Check switch. Replace if defective.
3. Defective PWM card on joystick S7.
   - Check joystick card. Replace if defective.
4. Loose or broken wire #13 down or #15 reverse from lift/drive switch S3 to base terminal block.
   - Check continuity. Replace if defective.

4.1-6 No Up or Forward Only Function from Platform Control Console

1. Loose or broken wire “B” from proportional controller S7 to lift/drive switch S3.
   - Check continuity. Replace if defective.
2. Lift/Drive switch S3 defective.
   - Check switch. Replace if defective.
3. Defective PWM card on joystick S7.
   - Check joystick card. Replace if defective.
4. Loose or broken wire #14 up or #16 forward from lift/drive switch S3 to base terminal block.
   - Check continuity. Replace if defective.

4.1-7 No Up Function from Platform or Base Control Console

1. Loose or broken wire #14 from base terminal block to up valve coil 3H-14.
   - Check continuity. Replace if defective.
2. Loose or broken wire #02 from base terminal block to up valve coil 3H-14.
   - Check continuity. Replace if defective.
3. Defective up valve coil 3H-14.
   - Check continuity through coil. Replace if defective.
4. Loose or broken wire #14 from base terminal block to CM1 control module pin P2-3.
   - Check continuity. Replace if defective.
5. Open diode D14.
   - Check diode. Replace if defective.
6. Open diode D21.
   - Check diode. Replace if defective.
7. Machine not level. (Above high speed limit switch)
   - Use on level surface.
8. See 4.1-6 platform controls or 4.1-8 base controls of this section for more troubleshooting information.

Electrical System (Continued)

4.1-8 No Up Function from Base Control Console

1. Defective up/down switch S2.
   - Check switch. Replace if defective.
2. Loose or broken wire #14E from up/down switch S2 to base terminal block.
   - Check continuity. Replace if defective.
3. Open or defective diode D14E-1.
   - Check diode. Replace if defective.
4. Open or defective diode D14E-2.
   - Check diode. Replace if defective.

4.1-9 No Down Function from Platform or Base Control Console

NOTE

Down function is not proportionally controlled.

1. Loose or broken wire #13 from base terminal block to CM1 control module pin P2-4.
   - Check continuity. Replace if defective.
2. Defective down relay 28CR2 or Aux. down relay 28ECR2.
   - Check relay. Replace if defective.
3. Loose or broken wire #02 from base terminal block to down relay 28CR2 or Aux. down relay 28ECR2.
   - Check continuity. Replace if defective.
4. Loose or broken wire #13 from base terminal block to Aux. down relay 28ECR2.
   - Check continuity. Replace if defective.
5. Loose or broken wire #13A from Aux. down relay 28ECR2 to down relay 28CR2.
   - Check continuity. Replace if defective.
6. Loose or broken wire # 13B from down relay 28CR2 to down valve 2H-13B or holding valve 2H-13B-1 and 2H-13B-2 (if equipped).
   - Check continuity. Replace if defective.
7. Defective down valve coil 2H-13B.
   - Check continuity through coil. Replace if defective.
8. Defective lift cylinder holding valve coil 2H-13B-1 or 2H-13B-2 (if equipped).
   - Check continuity through coil. Replace if defective.
9. Loose or broken wire #02 from holding valve coil 2H-13B-1 or 2H-13B-2 (if equipped) or down valve coil 2H-13B to base terminal block.
   - Check continuity. Replace if defective.
10. See 4.1-5 platform controls or 4.1-10 base controls of this section for more troubleshooting information.

4.1-10 No Down Function from Base Control Console

1. Defective up/down switch S2.
   - Check switch. Replace if defective.
2. Loose or broken wire #13 from up/down switch S2 to base terminal block.
   - Check continuity. Replace if defective.

4.1-11 Steer Only Inoperative

1. Defective relay 17CR.
   - Check relay. Replace if defective.
2. Loose or broken wire #17B from diodes D23 and D24 to base terminal block TB1.
   - Check continuity. Replace if defective.

Electrical System (Continued)

3. Loose or broken wire #17B from 17CR steer relay to base terminal block TB1.
   - Check continuity. Replace if defective.
4. Loose or broken wire #17C from 17CR steer relay to diodes D17C and D17C-1.
   - Check continuity. Replace if defective.
5. Open or defective diode D17C or diode D17C-1.
   - Check diode. Replace if defective.

4.1-12 Drive Only Inoperative

1. Open or defective diode D17-1.
   - Check diode. Replace if defective.

4.1-13 No Drive or Steer when Platform Fully Lowered

1. Loose or broken wire #71 from base terminal block to drive override limit switch LS6.
   - Check continuity. Replace if defective.
2. Defective drive override switch LS6.
   - Check switch. Replace if defective.
3. Loose or broken wire #19 from drive override limit switch LS6 to base terminal block.
   - Check continuity. Replace if defective.

4.1-14 No Drive or Steer when Platform Elevated

1. Pothole protection bars not fully lowered.
   - Clear obstructions. Repair as needed.
2. Loose or broken wire #71 from base terminal block to pothole protection limit switch LS4.
   - Check continuity. Replace if defective.
3. Defective pothole protection limit switch LS4.
   - Check switch. Replace if defective.
4. Loose or broken wire #72 from pothole protection limit switch LS4 to base terminal block.
   - Check continuity. Replace if defective.
5. Loose or broken wire #72 from base terminal block to pothole protection limit switch LS5.
   - Check continuity. Replace if defective.
6. Defective pothole protection limit switch LS5.
   - Check switch. Replace if defective.
7. Loose or broken wire #19 from pothole protection limit switch LS5 to base terminal block.
   - Check continuity. Replace if defective.

4.1-15 Elevated Drive Speed Does Not Activate

1. Loose or broken wire #59 from base terminal strip to proportional relay 21ACR.
   - Check continuity. Replace if defective.
2. Loose or broken wire #59A from proportional relay 21ACR to resistor RST2.
   - Check continuity. Replace if defective.
3. Resistor RST2 is open.
   - Check resistor ohms, it should read approx. 30 ohms. Replace if defective.
4. Loose or broken wire #02 from resistor RST2 to base terminal block.
   - Check continuity. Replace if defective.
5. Proportional relay 21ACR defective.
   - Check relay, replace if defective.

Electrical System (Continued)

4.1-16 Platform Drives in Slow Speed Only

1. No output to wire #71 (while operating a drive function) from diode module DM1 at base terminal block TB1.
   - Check for 24 volts at #71 at terminal block. Replace diode module if no voltage found or is defective.
2. Loose or broken wire #71 from base terminal block to high speed limit switch LS1A.
   - Check continuity. Replace if defective.
3. Open or defective high speed limit switch LS1A.
   - Check switch. Replace if defective.
4. Loose or broken wire #21 from high speed limit switch LS1A to base terminal block.
   - Check continuity. Replace if defective.
5. Defective low voltage protection resistor RST3.
   - Check resistor. Replace if defective.
6. Loose or broken wire #21A from low voltage protection resistor RST3 to proportional relay 21ACR.
   - Check continuity. Replace if defective.
7. Proportional relay 21ACR defective.
   - Check relay, replace if defective.
8. Loose or broken wire #2 from proportional relay 21ACR to base terminal block.
   - Check continuity. Replace if defective.
9. Proportional controller S7 out of adjustment.
   - Adjust controller. Refer to Section 5, Joystick Adjusting Procedure.

4.1-17 Forward Drive Function Inoperative

1. Loose or broken wire #16 from lift/drive switch S3 to base terminal block.
   - Check continuity. Replace if defective.
2. Loose or broken wire #16 from base terminal block to CM1 control module pin P2-7.
   - Check continuity. Replace if defective.
3. Loose or broken wire #16 from base terminal block to forward drive valve coil 4H-16.
   - Check continuity. Replace if defective.
4. Forward drive valve coil 4H-16 defective.
   - Check continuity through coil. Replace if defective.
5. Loose or broken wire #02 from forward drive valve coil 4H-16 to base terminal block.
   - Check continuity. Replace if defective.
6. No output to wire #17 (while operating a forward drive function) from diode module DM1 at base terminal block TB1.
   - Check for 24 volts at #17 at terminal block. Replace diode module if no voltage found or is defective.

4.1-18 Reverse Drive Function Inoperative

1. Loose or broken wire #15 from lift/drive switch S3 to base terminal block.
   - Check continuity. Replace if defective.
2. Loose or broken wire #15 from base terminal block to CM1 control module pin P2-8.
   - Check continuity. Replace if defective.
3. Loose or broken wire #15 from base terminal block to reverse drive valve coil 4H-15.
   - Check continuity. Replace if defective.
4. Reverse drive valve coil 4H-15 defective.
   - Check continuity through coil. Replace if defective.
5. Loose or broken wire #02 from reverse drive valve coil 4H-15 to base terminal block.
   - Check continuity. Replace if defective.

Electrical System (Continued)

6. No output to wire #17 (while operating a reverse drive function) from diode module DM1 at base terminal block TB1.
   - Check for 24 volts at #17 at terminal block. Replace diode module if no voltage found or is defective.

4.1-19 Brake will not Release

1. No output to wire #17 (while operating a drive function) from diode module DM1 at base terminal block TB1.
   - Check for 24 volts at #17 at terminal block. Replace diode module if no voltage found or is defective.
2. Loose or broken wire #17 from base terminal strip to transfer relay 17CR.
   - Check continuity. Replace if defective.
3. Loose or broken wire #02 from base terminal strip to transfer relay 17CR.
   - Check continuity. Replace if defective.
4. Defective transfer relay 17CR.
   - Check relay. Replace if defective.
5. No output to wire #17B (while operating a drive function) from diode module DM1.
   - Check for 24 volts on #17B at the diode module. Replace diode module if no voltage found or is defective.
6. Loose or broken wire #17B from diode module DM1 to transfer relay 17CR.
   - Check continuity. Replace if defective.
7. Loose or broken wire #17A from transfer relay 17CR to brake coil 3H-17A.
   - Check continuity. Replace if defective.
8. Brake valve coil 3H-17A defective.
   - Check continuity through coil. Replace if defective.
9. Loose or broken wire #02 from brake valve coil 3H-17A to base terminal block.
   - Check continuity. Replace if defective.

4.1-20 High/Low Torque Inoperative

1. Open diode D15-1 (reverse) or D16-1 (forward).
   - Check diode. Replace if defective.
2. Loose or broken wire #7B from diodes D15-1 and D16-1 to lift/drive switch S3.
   - Check continuity. Replace if defective.
3. Defective lift/drive switch S3.
   - Check switch. Replace if defective.
4. Loose or broken wire #18 from lift/drive switch S3 to base terminal block.
   - Check continuity. Replace if defective.
5. Loose or broken wire #18 from base terminal block to high speed limit switch LS1B.
   - Check continuity. Replace if defective.
6. Defective high speed limit switch LS1B.
   - Check switch. Replace if defective.
7. Loose or broken wire #18A from high speed limit switch LS1B to rear drive manifold.
   - Check continuity. Replace if defective.
8. Defective speed valve coil 3H-18A-1 or 3H-18A-2.
   - Check continuity through coil. Replace if defective.
9. Loose or broken wire #02 from rear drive manifold to base terminal block.
   - Check continuity. Replace if defective.

Electrical System (Continued)

4.1-21 Right Steer Inoperative

1. Loose or broken wire #12B from lift/drive switch S3 to right steer switch S7-2.
   - Check continuity. Replace if defective.
2. Defective right steer switch S7-2.
   - Check switch. Replace if defective.
3. Loose or broken wire #23 from right steer switch S7-2 to base terminal block.
   - Check continuity. Replace if defective.
4. Loose or broken wire #23 from base terminal block to steer right valve coil 4H-23.
   - Check continuity. Replace if defective.
5. Defective steer right valve coil 4H-23.
   - Check continuity through coil. Replace if defective.
6. Loose or broken wire #02 from steer right valve coil 4H-23 to base terminal block.
   - Check continuity. Replace if defective.
7. No output to wire #17B (while operating a right steer function) from diode module DM1.
   - Check for 24 volts on #17B at the diode module. Replace diode module if no voltage found or is defective.

4.1-22 Left Steer Inoperative

1. Loose or broken wire #12B from lift/drive switch S3 to left steer switch S7-3.
   - Check continuity. Replace if defective.
2. Defective left steer switch S7-3.
   - Check switch. Replace if defective.
3. Loose or broken wire #24 from left steer switch S7-3 to base terminal block.
   - Check continuity. Replace if defective.
4. Loose or broken wire #24 from base terminal block to steer left valve coil 4H-24.
   - Check continuity. Replace if defective.
5. Defective steer left valve coil 4H-24.
   - Check continuity through coil. Replace if defective.
6. Loose or broken wire #02 from steer left valve coil 4H-24 to base terminal block.
   - Check continuity. Replace if defective.
7. No output to wire #17B (while operating a left steer function) from diode module DM1.
   - Check for 24 volts on #17B at the diode module. Replace diode module if no voltage found or is defective.

4.1-23 Power Extension Platform will not Extend or Retract

1. Lift/Drive switch S3 not in lift position.
   - Move switch to lift position.
2. Loose or broken wire #09 from lift/drive switch S3 to power extension platform enable switch S12.
   - Check continuity. Replace if defective.
3. Power extension platform enable switch S12 defective.
   - Check switch. Replace if defective.
4. Loose or broken wire #09A from power extension platform enable switch S12 to platform extend/retract switch S11.
   - Check continuity. Replace if defective.
5. Loose or broken wire #21B from platform control box to base terminal block.
   - Check continuity. Replace if defective.
6. Open diode D21B-1.
   - Check diode. Replace if defective.

Electrical System (Continued)

7. Open diode D21B-2.
   - Check diode. Replace if defective.
8. Loose or broken wire #02 from extend valve coil 4H-26 to retract valve coil 4H-27 to platform control box.
   - Check continuity. Replace if defective.

4.1-24 Power Extension Platform will not Extend

1. Powered extension platform extend/retract switch S11 defective.
   - Check switch. Replace if defective.
2. Loose or broken wire #26 from power extension platform extend/retract switch S11 to extend valve coil 4H-26.
   - Check continuity. Replace if defective.
3. Extend valve coil 4H-26 defective.
   - Check continuity through coil, replace if defective.
4. Open diode D26.
   - Check diode. Replace if defective.
5. Loose or broken wire #02 from extend valve coil 4H-26 to platform control box.
   - Check continuity. Replace if defective.

4.1-25 Power Extension Platform will not Retract

1. Powered Platform extend/retract switch S11 defective.
   - Check switch. Replace if defective.
2. Loose or broken wire #27 from power extension platform extend/retract switch S11 to retract valve coil 4H-27.
   - Check continuity. Replace if defective.
3. Retract valve coil 4H-27 defective.
   - Check continuity through coil, replace if defective.
4. Open diode D27.
   - Check diode. Replace if defective.
5. Loose or broken wire #02 from retract valve coil 4H-27 to platform control box.
   - Check continuity. Replace if defective.

4.1-26 Two or more Functions at one time

1. Shorted Diode.
   - Check continuity of all diodes. Replace if defective.

Hydraulic System

4.2-1 All Function Inoperative

1. Proportional valve 2H-59 defective or is sticking.
   - Check valve. Replace if defective.
2. Pump P1 defective.
   - Check pump. Replace if defective.

4.2-2 All System sluggish

1. System Relief Valve defective or not adjusted properly.
   - Adjust valve. Replace if defective.
2. Hydraulic pump P1 worn.
   - Check pump. Replace if defective.
3. Proportional valve 2H-59 contaminated or defective.
   - Clean. Replace if defective.

4.2-3 Platform Drifts Down

1. Defective lift cylinder seals at the gland or holding valve manifold.
   - Replace if damaged. Note: There are no piston seals, just wear rings.
2. Combination of defective holding valves 2H-13B-1 and 2H-13B-2, and either defective lowering valve 2H-13B or relief valve R2 or manual lowering valve V1.
   - Check valves. Replace if defective.

4.2-4 Platform Lifts Slowly

1. Open or leaking manual lowering valve V1.
   - Close valve. Replace if defective.
2. Lift relief valve R2 defective.
   - Check valve. Replace if defective.
3. Open manual override on holding valve 2H-13B-1 or 2H-13B-2.
   - Depress and turn manual override clockwise to close. Replace if defective.

4.2-5 Platform does not Lift

1. Open manual lowering valve V1.
   - Close valve. Replace if defective.
2. Hydraulic oil level too low.
   - Fully lower the platform. Fill hydraulic tank until fluid is at or slightly above the top mark on the sight glass.
3. Platform weight excessive.
   - Reduce platform load to maximum capacity.
4. Up valve 3H-14 defective or is sticking.
   - Check valve. Replace if defective.

4.2-6 Platform will not Lower

NOTE

Down function is not proportionally controlled.

1. Lowering valve 2H-13B defective or is sticking.
   - Clean valve. Replace if defective.
2. Defective holding valve 2H-13B-1 or 2H-13B-2.
   - Clean valve. Replace if defective.

Hydraulic System (Continued)

4.2-7 Platform Drives Slow

1. Free-wheeling valve V2 open or defective.
   - Close valve. Replace if defective.
2. Flow divider/combiner FD1 defective or is plugged.
   - Close valve. Replace if defective.
3. Drive motor M3 or M4 defective.
   - Check motors. Replace if defective.
4. Cushion cylinder C1 defective.
   - Check cylinder. Replace if defective.

4.2-8 Platform will not Drive in Forward or Reverse

1. Open free-wheeling valve V2.
   - Close Valve. Replace if defective.
2. Forward drive valve 4H-16 or reverse drive valve 4H-15 defective or is sticking.
   - Check Valve. Replace if defective.
3. Flow/Divider/Combiner valve FD1 defective or is plugged.
   - Check Valve. Replace if defective.
4. Counterbalance valve CB1 defective or is plugged.
   - Check Valve. Replace if defective.

4.2-9 Brake(s) will not Release

1. Brake valve 3H-17A defective or is sticking.
   - Clean valve. Replace if defective.
2. Brake orifice(s) 07 plugged.
   - Remove orifice(s). Clean and reinstall.
3. Defective internal brake piston seals.
   - Check brake pack will maintain pressure. If pressure is not maintained replace seals.
4. Damaged integral brake in wheel motor.
   - Inspect wheel motor assembly. Repair and replace as necessary.

4.2-10 Aerial Platform will not hold on a Grade

1. Worn or damaged brake discs.
   - Inspect brake discs for wear. Replace if worn or damaged.
2. Broken or damaged brake compression springs.
   - Check springs. Replace if defective.

4.2-11 Platform does not Steer

1. Right steer valve 4H-23 or left steer valve 4H-24 defective or sticking.
   - Clean valve. Replace if defective.
2. Steer cylinder C3 seals leaking.
   - Rebuild cylinder(s). Replace if damaged.
3. Mechanical binding in king pins.
   - Check for binding. Repair as needed.
4. Orifices 03 plugged.
   - Clean orifices, and reinstall.

4.2-12 Power Extension Platform will not Extend or Retract

1. Platform extend valve 4H-26 or platform retract valve 4H-27 defective or is sticking.
   - Clean valve. Replace if defective.

Hydraulic System (Continued)

2. Powered platform cylinder C5 seals defective.
   - Rebuild cylinder. Replace if damaged.
3. Mechanical binding in power extension platform mechanism.
   - Check for binding. Repair as needed.

4.2-13 High/Low Torque Inoperative

1. Stuck speed valve 3H-18A-1.
   - Clean valve. Replace if defective.
2. Stuck speed valve 3H-18A-2.
   - Clean valve. Replace if defective.

Notes

Section 5
PROCEDURES

Table of Contents

Service and Maintenance

Platform

Base

Load Sensing System

5

Notes

General

The following information is provided to assist you in the use and application of servicing and maintenance procedures contained in this chapter.

Safety and Workmanship

Your safety, and that of others, is the first consideration when engaging in the maintenance of equipment. Always be conscious of weight. Never attempt to move heavy parts without the aid of a mechanical device. Do not allow heavy objects to rest in an unstable position. When raising a portion of the equipment, ensure that adequate support is provided.

Platform

5.1-1 OEM Controller Electronics Information

Flow Control

Single coil or solenoid for single direction. The coil has two connections; one is wired to the P.C. Board (A) terminal and the other is wired to (-), or the negative side of the supply voltage. Switches to control directional valves may be provided on the controller.

Adjustment Procedures

Adjustments are made by turning a trimpot adjustment screw. The trimpots are multi-turn, end to end-devices. It may be necessary to turn the adjustment screw several turns to observe a change in output.

Clockwise (CW) adjustment of the trimpot increases the output.

Counter-clockwise (CCW) adjustment of the trimpot decreases the output.

Adjustments affect output current, voltage or percentage of duty cycle to the coil. The minimum and maximum output is preset at the factory. However, for optimum performance, they must be adjusted while the equipment is operating.

Although the following adjustments affect the current/voltage or percentage of duty cycle, the best way to adjust the function is to observe the response or speed of the function. The following adjustments affect function response, or speed. There may be some interaction between adjustments, making it necessary to repeat the adjustment in order to achieve the desired response.

"Threshold" Adjustments

Adjusts the initial current flow or duty cycle, affecting the function response or speed when the handle is first moved from the off position. Deflect the handle slowly to the position where the controller first turns on. Adjust the threshold trimpot screw to the point where the controlled function just starts to move, then turn the trimpot screw one, full turn in the counterclockwise direction. This adjustment should be done first.

"Maxout" Adjustments

Adjusts the full stroke current or duty cycle affecting the maximum function response, or speed when the handle is deflected to its full travel. Fully deflect the handle, and adjust the maxout trimpot for maximum desired function response or speed. To obtain proportional resolution, it is important that the function starts to slow down as soon as the handle is moved back from the fully deflected position.

The ideal adjustment occurs when the function just begins to move when the handle is deflected, and the output increases until it reaches its maximum desired response or speed at the end of handle travel.

5.1-2 OEM Controller Troubleshooting

Problem

1. The function will not operate when the handle is moved. The LEDs do not light
   A. Check that voltage is present at the positive (+)input terminal.
   B. Check that ground is connected to the negative (-) terminal.
   C. If there is an in-line fuse, check to see if it is good.
   D. Check the controller on/off switch and the connectors. Voltage should be present at the (X) terminal when the controller is turned on.
   E. Check that valve wiring is not shorted to ground. The LEDs will not light.
   F. Check that valve wiring is not open. The LEDs will light, but the intensity will not vary.
   G. Check trimpot settings. Fully "CCW" turns output off, "CW" turns output fully on.
2. The function jumps or lurches when turned on.
   A. Perform "Threshold" adjustment procedures.
3. The function reaches maximum speed before the handle is fully deflected,
   A. Perform "Maxout" adjustment procedures.
4. The function speed remains constant regardless of the degree of handle deflection.
   A. Perform "Maxout" adjustment procedures.

IRS Option

1. Function speed reacts too slowly or too quickly in relation to handle deflection.
   A. Check "IRS" (Ramp) trimpot adjustment. "CW" increases ramp time, "CCW" decreases ramp time.

Integrated Ramp System (IRS)

Provides smooth function response ,when reacting to an abrupt change in handle deflection. "CW" rotation of the trimpot increases ramp time and slows the response time. "CCW" decreases ramp time and increases the response time. To increase the ramp time, turn the adjusting screw "CW" a few turns, then move the controller handle abruptly. Continue to adjust until a smooth response is observed. Most controllers have on/off contacts which remove power from the P.C. Board when the handle is returned to the off position. When the handle is abruptly returned to neutral, the output will not ramp down, and the function will stop.

Ramp Thru Off

The P.C. Board should be adjusted as outlined in the IRS adjustment procedure. If the handle is abruptly returned to neutral (OFF) the output will ramp down to off. Ramp time is factory set to 2 seconds, unless otherwise specified.

NOTE

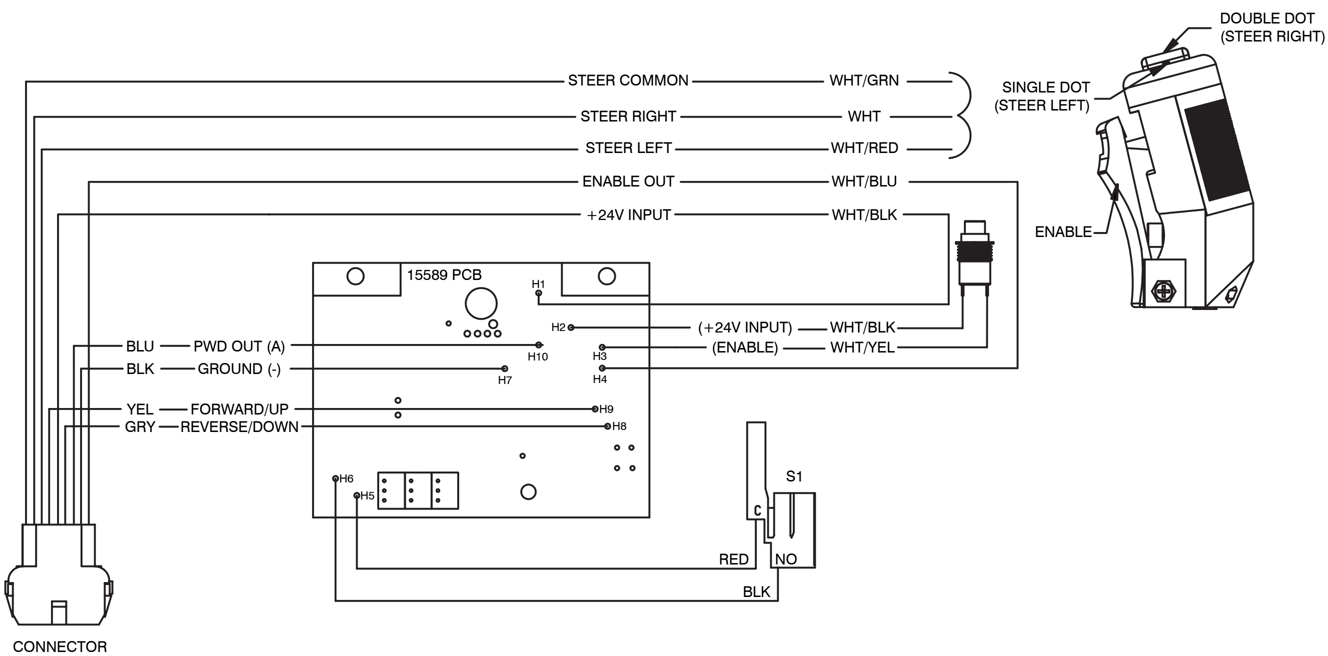
Trimpots should be sealed with nail polish or enamel based paint.

⚠ WARNING

Do not use RTV silicone.

5.1-3 OEM Controller switch wiring

WIRE CHART		
COLOR	FROM	TO
WHT/RED	STEER LEFT	PIN #1
WHT/GRN	STEER COMMON	PIN #2
WHT	STEER RIGHT	PIN #3
YEL	FORWARD/UP	PIN #4
WHT/BLK	+24V INPUT	PIN #5
GRY	REVERSE/DOWN	PIN #6
BLU	PWM OUT (A)	PIN #7
BLK	GROUND (-)	PIN #8
WHT/BLU	ENABLE OUT	PIN #9



Base

5.2-1 System Relief Pressure Adjustment

1. Locate the system pressure quick disconnect port on the main manifold.
2. Install a calibrated 5000 psi gauge to the system pressure quick disconnect port.
3. Remove the platform control console the guardrail and disconnect from the main control cable.
4. Locate the main control cable plug at the rear of the aerial platform.
5. Disconnect the main cable and connect the platform control console into the plug.
6. At the main manifold, loosen the locknut on the system relief valve R1.
7. Select drive with the lift/drive select switch on the platform control console.
8. Engaged steer right and hold.
9. Observe reading on gauge. Adjust the R1 system relief value listed on the serial number plate. Turning the stem on the relief valve clockwise will increases pressure. Turning the stem counterclockwise will decreases pressure.
10. Release steer switch and tighten the locknut.
11. Remove the gauge from system pressure test port.

5.2-2 Lift Pressure Adjustment

NOTE

Adequate area to raise the platform to full height is required for the following steps.

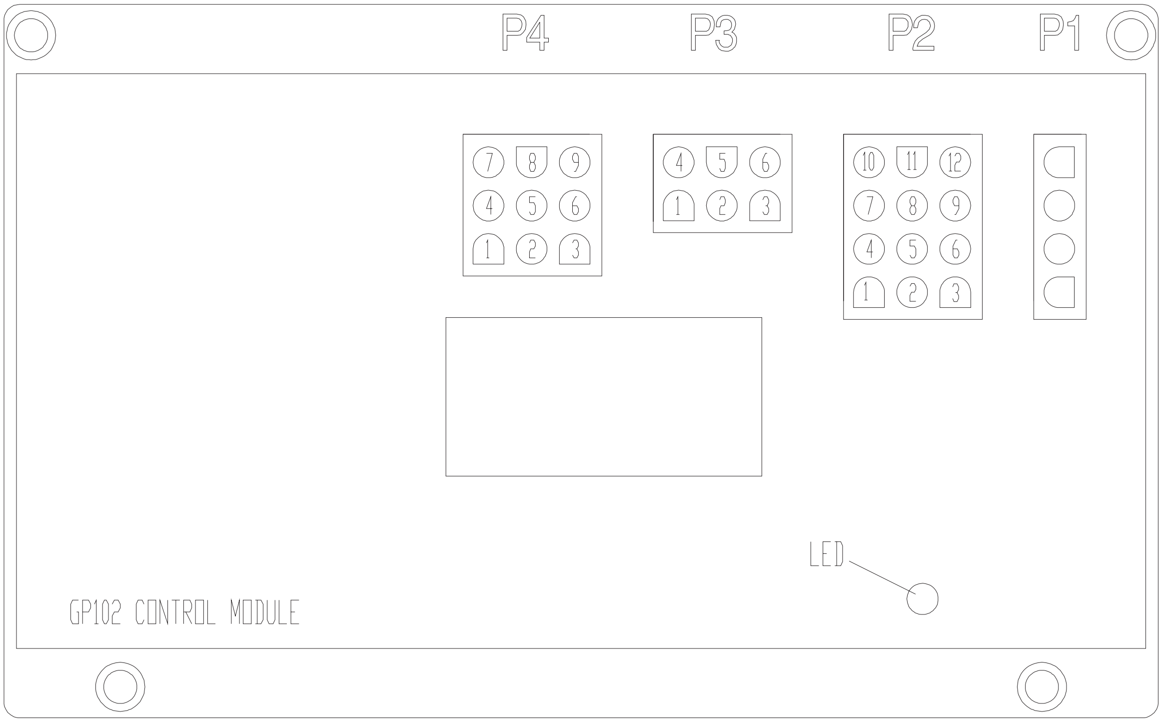
1. Locate the lift pressure test port on the main manifold.
2. Install a calibrated 5000 psi gauge to the lift pressure quick disconnect port.
3. At the main manifold, loosen the locknut on the lift relief valve R2.
4. Close the manual lowering valve. Use the lift switch at the base control console to raise the platform to full height and hold the lift up switch on.
5. Observe the reading on the gauge. Adjust the R2 relief valve to the value listed on the serial number plate. Turning the stem of the relief valve clockwise will increases pressure. Turning the stem counterclockwise will decreases pressure.
6. Remove the gauge from lift pressure test port.

NOTE

Pressure setting may vary as aerial platform components wear. The lift pressure should be set for rated load only.

Load Sensing System

5.3-1 Control Module Pin Reference Chart



PLUG	PIN #	WIRE # AND COLOUR	WIRE FUNCTION
P1	The Calibration Connection		
P2	1	Not Used	Not Used
P2	2	10E Black/White	Input Power From Base Terminal Strip To Confirm Lower Control Is Selected
P2	3	14 Black	Raise Platform Input
P2	4	13 Orange	Lower Platform Input
P2	5	Not Used	Not Used
P2	6	Not Used	Not Used
P2	7	16 White/Black	Forward Direction Input
P2	8	15 Blue	Reverse Direction Input
P2	9	Not Used	Not Used
P2	10	18B Red/Black	Input From LS1 High Speed Limit Switch To Verify ON/OFF Limits
P2	11	02 White	Negative Input From Base Terminal Strip
P2	12	7A Red	Main Power Input From Base Terminal Strip
P3	1	22 Red	Output To FL-22 Flashing Light
P3	2	29 Black	Output To BP-29 Beeper
P3	3	60 Black/White	Output To Overload Warning Light On Control Box
P3	4	28 Green/Black	Output To 28CR1 Tilt Relay And 28CR2 Down Relay
P3	5	02 White	Negative for Flashing Light and Beeper
P3	6	28E Green/White	Output To 28ECR1 Aux. Tilt Relay And 28ECR2 Aux. Down Relay
P4	1	Not Used	Not Used
P4	2	60A Green	Varied Input From Transducer
P4	3	28B Green	Varied Input From Angle Transducer
P4	4	Not Used	Not Used
P4	5	Not Used	Not Used
P4	6	910 Black	Positive Signal To Angle Transducer
P4	7	900 White	Negative Signal To Pressure Transducer
P4	8	902 White	Negative Signal To Angle Transducer
P4	9	910A Black	Positive Signal To Pressure Transducer

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5.3-2 LED Error Codes - Quick Reference Chart

HELP Message	LED indication
EVERYTHING OK	Steady on
IN GROUND MODE!	Steady on
OVERLOAD FUNCTIONS DISABLED!	6/6
VEHICLE TILTED	1/1
VEHICLE OVERLOADED	1/2
WAITING FOR B+ ON P2-12	5/2
ARMGUARD ACTIVE!	1/3
TOO HIGH - DRIVE PREVENTED	1/4
TOO HIGH - LIFT UP PREVENTED	1/5
TESTING HWFS	7/8
IDLE TIMEOUT ACTIVE!	Always off
WAITING FOR NEUTRAL	5/5
ARMGUARD ACTIVE!	2/3
ELEVATION SWITCH SHIFTED?	2/1
ELEVATION SWITCH STUCK?	2/2
NO LAST CALDATE!	6/3
LOAD NOT CALIBRATED	6/2
DRIVE/LIFT INPUTS FAULTY!	5/6
UP/DOWN SELECT INPUTS ACTIVE TOGETHER	5/4
INVALID LOAD - CHECK SENSORS	6/4
HEIGHT NOT CALIBRATED	6/1
INVALID HEIGHT - CHECK SENSOR	6/5
EMS INPUTS FAULTY!	5/2
B+ SUPPLY TOO LOW	5/1
P4-1 OR P5-1 SHORT TO 0V?	4/1
P3-4 SHORT TO SUPPLY!	4/2
P3-4 SHORT TO 0V?	4/3
P3-4 SHORT TO SUPPLY?	4/4
P3-6 SHORT TO 0V?	4/5
P3-6 SHORT TO SUPPLY?	4/6
FAULT: BAD TILT SENSOR	7/1
FAULT: BAD HWFS	7/2
FAULT: BAD SLAVE ANALOGS	7/3
FAULT: BAD STRAIN MONITORS	7/4
FAULT: BAD SLAVE MICRO	7/5
FAULT: HWFS STALLED!	7/6
STARTUP!	7/7
FACTORY OVERRIDE	6/7

60405AB

Reading the Codes:

In order to read the fault codes, a sequence of pauses and flashes can be seen on the LED mounted on the GP102 module. The codes are continuously displayed by the LED until the fault is cleared, the GP102 reset and no longer detects the fault, or idle timeout becomes active.

The sequence is as follows:

1. Quarter second flashes followed by quarter second pauses indicate the first digit.
2. A 1.5 second pause.
3. Quarter second flashes followed by quarter second pauses indicate the second digit
4. A 4 second pause. Repeat steps 1-4

Since the GP102 only reports one error, only one code can be read from the LED per instance. If the error is cleared and another error is present, it will then be presented.

5.3-3 LED Error Codes - Code Breakdown Chart

Diagnostic sequence dependant on LED flash code:

No Last Caldate	63
Load Not Calibrated	62
Height Not Calibration	61

An EZcal is required!

Waiting For Neutral	55
Drive/Lift Inputs Faulty!	56
Up/Down Select Inputs Active Together	54
EMS Inputs Faulty!	52

Check inputs on P2 pins 1,2,3,4,5,6,7,8.

P3-4 Short To Supply!	42
P3-4 Short To Supply?	44
P3-6 Short To Supply?	46

Disconnect plug P3. If fault clears there is a problem with the wiring from P3-4 or P3-6 to the rest of the vehicle.

Armguard Active!	23
Elevation Switch Shifted?	21
Elevation Switch Stuck?	22

If the 23 flash code is triggered by armguard, it will occur once then clean. This is not a true fault but just an indication of the reason for the vehicle stop. If the 21 or 22 flash code is triggered by a fault with the elevation switch, it will not clear. Check that the elevation switch correctly opens/closes when the platform is raised/lowered.

P3-4 Short To 0V?	43
P3-6 Short To 0V?	45

Disconnect plug P3. If fault clears there is a wiring fault from P3-4 or P3-6 to the rest of the vehicle.

Invalid Load - Check Sensors	45

Check the voltage out of the pressure transducer, into P4-2. It should be between 0.5V (zero pressure) and 4.5V (maximum pressure) and should vary as the platform load & position varies.

Waiting For B+ on P2-12	52
B+ Supply Too Low	51
P4-1 Or P5-1 Short To 0V?	41

Check that the battery voltage is not too low.
Verify battery voltage on P2-12.
Disconnect plug P4 – if the fault clears there is a wiring fault from P4-1 to the rest of the vehicle.

5.3-3 LED Error Codes - Code Breakdown Chart (Continued)

Vehicle Tilted	11
Vehicle Overloaded	12
Too High - Drive Prevented	14
Too High - Lift Up Prevented	15

These are not true faults but an indication that vehicle movement is prevented. Remove excessive load from the platform. Lower the platform if close to maximum height. Move the vehicle to level ground.

Invalid Height - Check Sensor	65

Check the voltage out of the height transducer, into P4-3. It should be between .4V and 4.6V and should vary as the platform position varies.

Testing HWFS	78
Start Up!	77

These are not true faults unless they do not clear.

Overload Functions Disabled!	66
Factory Override	67

These are not true faults – the GP102 has been configured to suppress overload functionality.

Idle Timeout Active!	Always Off
Fault: Bad Tilt Sensor	71
Fault: Bad HWFS	72
Fault: Bad Slave Analogs	73
Fault: Bad Strain Monitors	74
Fault: Bad Slave Micro	75
Fault HWFS Stalled!	76

Action a function to clear the idle timeout if it occurred. Ensure the GP102 is correctly mounted – incorrect mounting can cause the “bad tilt sensor” diagnostic to occur. Otherwise there may be an internal problem with the GP102.

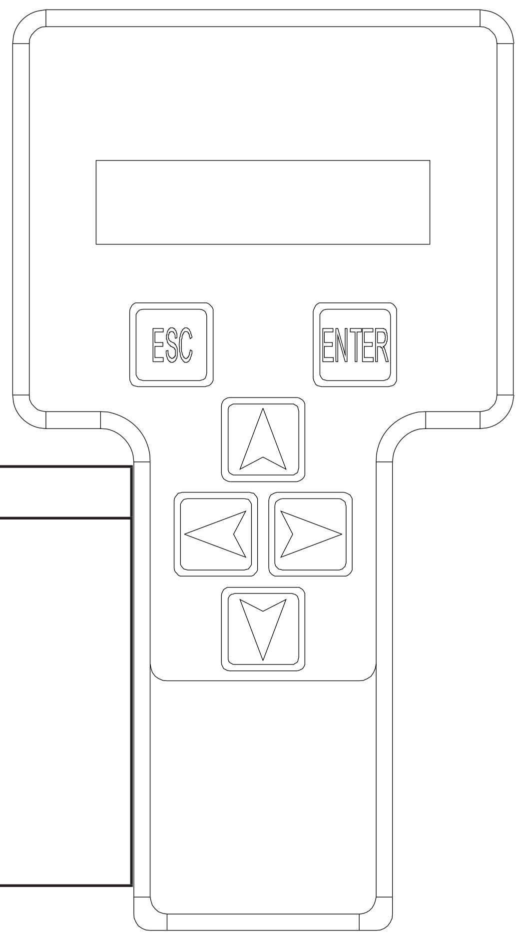
5.3-4 Hand Held Calibration/Diagnostic Tool Key Functions

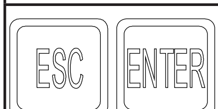
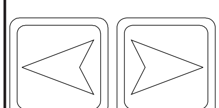
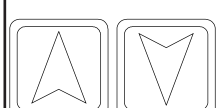
⚠ WARNING

Only trained and authorized personnel shall be permitted to service and aerial platform.

⚠ WARNING

Read all instructions closely before attempting each phase or the calibration procedure.



Symbol	Key Function
	**ESC/ENTER Buttons** To move back and forth between menu and sub-menu
	**LEFT/RIGHT Buttons** Select menus and setting to be adjusted
	**UP/DOWN BUTTONS** Adjust setting values

5.3-5 Control Module Load Calibration - Code Messages & Definitions

During calibration the following failure message may appear:

Code F01: Check HWFS

This message is given if the GP102 startup tests have not completed.

- Check HELP message for more information.

Code F02: Not Ground Mode

This message is given if the machine is not in ground mode (P2-2 must be high).

- Calibration can only be carried out in ground mode.

Code F03: Not Stopped

This message is given if any function switch is closed.

- Check DIAGNOSTICS / SWITCHES to see which function switch is closed.

Code F04: Tilted

This message is given if the machine is tilted.

- Calibration must be carried out with the machine level. If the machine is level, use the SETUPS / TILT SETUPS to set the GP102 level.

Code F05: Bad Height

This message is given if the height sensor output (P4-3) is out of range at the start of calibration.

- The height sensor output must be 3.7V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

Code F06: Check Elev

This message is given if the elevation switch (P2-10) is closed at the start of calibration, when the operator has confirmed the “PLATFORM DOWN?” question.

- If the platform is down, check the elevation switch wiring.

Code F08: Check Elev

This message is given if the elevation switch (P2-10) is closed at the end of calibration, when the platform should be fully raised.

This message would occur if the UP switch was accidentally opened near the start of the lift.

- If the platform is fully raised, check the elevation switch wiring.

Code F09: Bad Height

This message is given if the height sensor output (P4-3) is out of range at the start of calibration.

- The height sensor output must be 3.7V. Check DIAGNOSTICS / SENSORS to see the output.

Code F10: Bad Height

This message is given if the height sensor output (P4-3) is out of range at the end of calibration. The height sensor output must be between 0.9V and 4.1V.

- Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

Code F11: Not Up

This message occurs at the start of calibration if the operator selects a function other than UP.

- Select the UP function only.

Code F13: Low Height Range

This message occurs at the end of calibration if the height sensor output did not change sufficiently to give a reasonably accurate platform height estimate.

This message could occur if the UP switch was accidentally opened too early (when the platform is not fully raised).

- DIAGNOSTICS / SENSORS can be used to check the height sensor output (P4-3). A difference of at least 1V is to be expected.

Code F15: Check Elev

This message is given if the elevation switch (P2-10) is closed when the platform has been fully lowered at the end of calibration.

This message would occur if the DOWN switch was accidentally opened before the platform was fully lowered.

- If the platform is fully lowered, check the elevation switch.

Code F16: Low Elev.open

This message is given if the elevation switch (P2-10) opened during lift at a too low height (below 5%).

- Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened. Set up elevation switch to manufacturers’ specifications and calibrate load.

Code F17: High Elev.open

This message is given if the elevation switch (P2-10) opened during lift at a too high height (above 25%).

- Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened. Set up elevation switch to manufacturers’ specifications and calibrate load.

Code F18: Low Elev.close

This message is given if the elevation switch (P2-10) closed during lower at a too low height (below 5%).

- Check CALIBRATIONS / HEIGHT CALS; the “ElevDown” value shows the recorded height where the switch opened. Set up elevation switch to manufacturers’ specifications and calibrate load.

Code F19: High Elev.close

This message is given if the elevation switch (P2-10) closed during lower at a too high height (above 25%).

- Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened. Set up elevation switch to manufacturers’ specifications and calibrate load.

Code F20: Height<>0%

This message occurs if the platform height is not 0% after the platform has been fully lowered during either STATIC lift.

The platform must return to the same height each time it is fully lowered.

- Check DIAGNOSTICS / SYSTEM to check the height.

Code F28: Bad Height

This message indicates a problem with the height sensor output (P4-3) during calibration.

The height sensor output must be between 1.0V and 4.0V at all times.

- Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

Code F42: Low Pressure

This message indicates that the pressure transducer output (P4-2) is too low (0.5V or less) at the beginning of calibration.

- Check DIAGNOSTICS / SENSORS to read output.

Code F43: High Pressure

This message indicates that the pressure transducer output (P4-2) is too high (4.5V or more) at the beginning of calibration.

- Check DIAGNOSTICS / SENSORS to read output.

Code F44: Low Pressure

This message indicates that the pressure transducer output (P4-2) is too low (0.5V or less) at a measurement point.

- Check DIAGNOSTICS / SENSORS to read output.

Code F45: High Pressure

This message indicates that the pressure transducer output (P4-2) is too high (4.5V or more) at a measurement point.

- Check DIAGNOSTICS / SENSORS to read output.

Code F46: Check Elev

This message indicates that the elevation switch opened more than once during calibration lifting.

Code F47: Check Elev

This message indicates that the elevation switch closed more than once during calibration lower.

Code F48: Bad Pressure

This message indicates that the pressure transducer output (P4-2) is out of range at the beginning of calibration.

- Check DIAGNOSTICS / SENSORS to read output.

Code F52: Too Few

This message indicates that not enough measurements were recorded during calibration lifting or lowering.

Code F98: Out of Range

This message indicates that the “fine tune” calibration is unacceptable.

This is probably due to a faulty transducer or faulty/open holding valve(s)/ emergency lowering valve.

During calibration the following information messages may appear:

Platform Down?

This message is prompting for confirmation that the platform is fully lowered. If necessary the DOWN switch can be activated to lower the platform. Press ENTER to confirm when the platform is fully lowered.

Platform Empty?

This message is prompting for confirmation that the platform is completely empty. Press ENTER to confirm if the platform is empty.

Platform Loaded?

This message is prompting for confirmation that the platform is loaded to rated load Press ENTER to confirm if the platform is loaded.

Please Lift

This message is prompting for the platform to be raised. The UP switch should be closed.

Please Lower

This message is prompting for the platform to be lowered. The DOWN switch should be closed.

Lift Empty

This message is displayed while the platform is being raised to the next measurement height, when an EMPTY platform is being calibrated.

Lift Loaded

This message is displayed while the platform is being raised to the next measurement height, when a LOADED platform is being calibrated.

Lifting

This message is displayed while the platform is being raised, during HEIGHT-only calibration.

Measuring #

This message is displayed when the platform is stopped during calibration, when the GP102 takes a measurement. There will be a short delay while the machine is allowed to stabilize after movement is stopped.

Must Go Down!

This message occurs if the wrong switch is closed when the GP102 is waiting for the platform to be lowered.

Must Go Up!

This message occurs if the wrong switch is closed when the GP102 is waiting for the platform to be raised.

Please Wait

This message indicates that the GP102 is busy; the delay will be short (no more than 5 s).

Lower Empty

This message is displayed while the platform is being lowered to the next measurement height, when an EMPTY platform is being calibrated.

Lower Loaded

This message is displayed while the platform is being lowered to the next measurement height, when an EMPTY platform is being calibrated.

Lowering

This message is displayed while the platform is being lowered, during HEIGHT-only calibration.

Total Data:

This message is displayed at the end of each phase, to confirm the number of measurements recorded by the GP102.

Caldate

This message is prompting for the date to be entered; it is stored to identify when the machine was calibrated.

The last calibrate date can be viewed in DIAGNOSTICS / LOG. Press LEFT & RIGHT to select the flashing digits. Press UP & DOWN to change the flashing digits. Press ENTER when the entry is complete. IMPORTANT: The date 00/00/00 is not allowed!

Finished

This message confirms that calibration is complete and successful.

5.3-6 Control Module Load Calibration Procedure

1. Move the aerial platform to a test area where the platform can be elevated to its maximum working height and reach.

2. Ensure the aerial platform is parked on a firm, level surface.

IMPORTANT

Each phase must be completed before the next phase can be carried out.

All phases must be completed before the aerial platform can be operated.

IMPORTANT

Always follow the instructions of the Calibration instrument.

IMPORTANT

Make sure the aerial platform is on BASE mode.

NOTE

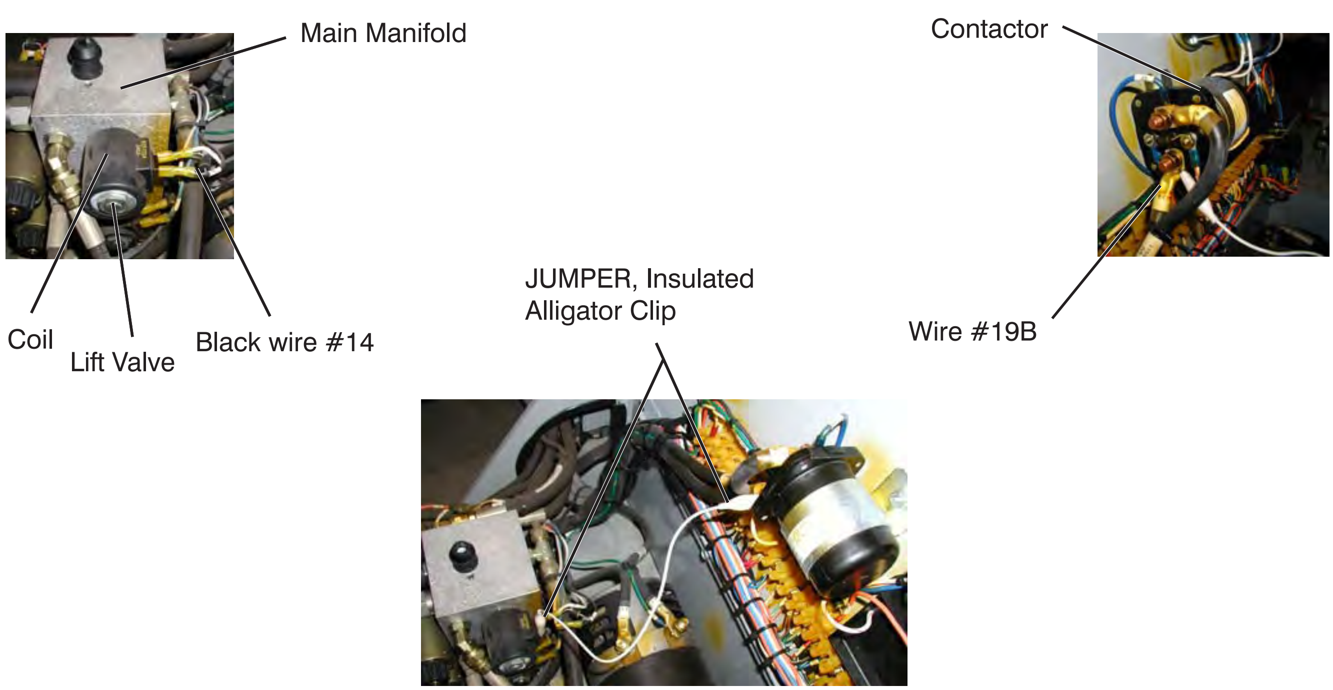
To ensure a good and clear contact, clean the wire terminals before attaching the jumper clip.

3. Locate the main manifold inside the hydraulic/electric tray.

4. Disconnect the black wire #14 from the lift coil.

5. Locate the contactor on the electrical panel assembly.

6. The jumper connection must be connected between the contractor (wire #19B) and the lift coil (instead of the black wire #14)



7. Connect the Easy-Cal tool to the P1 connector on the CONTROL MODULE.

8. The display will show "**Help: Press Enter**".
   By using Left/Right buttons, select the "Access Level (?)" from the menu and press the **ENTER** button.

Contact Skyjack Service Department at:
(44) 1691-676 236 for your Access Level Code Number.

9. The display will show "**Access Level Code (xxxx)**".
   By using the Up/Down buttons, enter the Access Level Code (xxxx) followed by pressing the **ENTER** button.

10. The display will show "**Access Level 2**".
    By using Left/Right buttons, select the "Setups" from the menu and press the **ENTER** button.

11. The display will show "**Machine Defaults**".
    Select the "Machine Defaults" from the menu and press the **ENTER** button.

12. The display will show "**Defaults, 0 = Custom**".
    By using Left/Right buttons, select the "**X = Group Code**" from the menu and press the **ENTER** button.

13. The display will show "**X=GROUP CODE**". (Refer to 5.3-7 for group code)
    By using the Up/Down buttons, enter the "Group Code (?)" then by using Left/Right buttons, select the "**Curve**" from the menu.

14. The display will show "**X=CURVE**". (Refer to 5.3-7 for curve code)
    By using the Up/Down buttons, enter the "Curve Code (?)" followed by pressing the **ESCAPE** button.

15. The display will show "**Machine Defaults**".
    By using Left/Right buttons, select the "Tilt Setups" from the menu and press the **ENTER** button.

16. The display will show "**Tilt Setups: Calibrate Level**".
    Select the "**Tilt Setups: Calibrate Level**" from the menu and press the **ENTER** button.

17. The display will show "**Calibrate Level: Yes: Enter, No: ESC**".
    Select the "Yes" from the menu by press the **ENTER** button.

18. The display will show "**Calibrate Level: Tilt 0.0' , 0.0'**".
    Select the "**ESCAPE**" from the menu once.

19. The display will show "**Tilt Setups Calibrate Level**".
    Select the "**ESCAPE**" from the menu once again.

20. The display will show "**Setups Tilt Setups**".
    By using Left/Right buttons, select the "Load Setups" from the menu and press the **ENTER** button.

21. The display will show "**Load Setups: Calibrate Load**".
    Select the "**Load Setups: Calibrate Load**" from the menu and press the **ENTER** button.

22. The display will show "**Calibrate Load: Platform Down?**".
    Asking for confirmation that the platform is fully lowered?
    Check that the platform is fully lowered then press the **ENTER** button to confirm.

23. The display will show “**Calibrate: Loaded Empty? No**”.
    Asking for confirmation that the platform is empty?
    Check that the platform is empty
24. By using the Up/Down buttons, enter the “Yes” followed by pressing the **ENTER** button.

25. The display will show “**Calibrate Load: Please Lift......**”.
    Waiting for the lift switch to be activated.

26. Hold the lift switch and keep holding it until the platform is fully elevated.

IMPORTANT

If the lift switch is released earlier than full-height position, the calibration will have to be aborted and repeated from the beginning!

27. When the system detects the lift switch closed, the display will show “**Calibrate Load: Lift Empty**”.

28. After a delay, the system will stop the platform lifting and will take height & pressure measurements; the display will show “**MEASURING # xx**” When the measurements have been taken, the platform will resume lifting.

NOTE

The Lifting......stopping.......measuring....lifting process will continue until the platform reaches full height.

29. When the platform reaches full height release the lift switch.

30. The display will briefly show “**TOTAL DATA: 04**” to indicate the number of measurements taken.

31. The display will show “**Calibrate Load: Please Lower......**”.

IMPORTANT

If the lower switch is released earlier than full-lower position, the calibration will have to be aborted and repeated from the beginning!

32. Hold the lower switch and keep holding it until the platform is fully lowered.

33. When the system detects the lower switch closed, the display will show “**Calibrate Load: Lower Empty**”

34. After a delay, the system will stop the platform lowering and will take height & pressure measurements; the. display will show “**MEASURING #xx**”. When the measurements have been taken, the platform will resume lowering.

NOTE

The lowering......stopping.......measuring....lowering process will continue until the platform is fully lowered.

35. When the platform is fully lowered, release the lower switch.

36. The display will show briefly “**TOTAL DATA: 04**” to indicate the number of measurements taken.

37. The display will show “**Calibrate Load: Caldate: mm/dd/yy**”.
    It is recommended that the current date be entered here to provide easy taking of the data of last calibration.
    The current date must be entered using the **LEFT**/**RIGHT** and **UP**/**DOWN** buttons.

38. Press ENTER to complete date entry (the system will store it). Display will show "**FINISHED**".

39. Remove the jumper wire and re-connect the black wire #14 to the coil removed earlier.

40. Close the hydraulic/electric tray.

NOTE

Continuing partially complete load calibration.

If the phase does not need to be repeated, just press **ENTER** to move on.
If the phase does need to be repeated, press **UP** or **DOWN** to change "**NO**" to "**YES**" then press **ENTER**.

5.3-7 Curve/Group Codes Chart

Model	Number of Extension Platforms	Curve Code	Group Code
3220	1 Manual Extension Platform	3	3
3220	1 Powered Extension Platform	4	3
3226	1 Manual Extension Platform	5	3
4620	1 Manual Extension Platform	8	3
4620	1 Powered Extension Platform	9	3
4626	1 Manual Extension Platform	12	3
4626	1 Powered Extension Platform	13	3
4632	1 Manual Extension Platform	14	3

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